JPRS-UMA-86-070

19 DECEMBER 1986

USSR Report

MILITARY AFFAIRS

FOREIGN MILITARY REVIEW

No 7, July 1986

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service (NTIS), Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semimonthly by the NTIS, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS-UMA-86-070

19 DECEMBER 1986

USSR REPORT

MILITARY AFFAIRS

FOREIGN MILITARY REVIEW

No. 7, July 1986

Except where indicated otherwise in the table of contents, the following is a complete translation of the Russian-language monthly journal ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, published in Moscow by the Ministry of Defense.

CONTENTS

Editorial on Internationalism, Unity of Pact, Arms Control (pp 3-6)..... 1

GENERAL MILITARY PROBLEMS

Defining Basic Concepts of U.S. National Security Policy (pp 7-11)
(B. Putilin)..... 7

Critique of Command and Control of U.S. Strategic Forces (pp 11-13)
(I. Kulkov)..... 13

"Psychological Operations" in the British Armed Forces (pp 13-14)
(I. Dzhuri) (Not translated)

GROUND FORCES

Bundeswehr Tank Division in the Offensive (pp 15-20)
(A. Yegorov)..... 16

Combat Helicopters of NATO Armies (pp 20-25)
(V. Nelin)..... 24

The Spanish Teruel-3 Multiple Launch Rocket System (pp 25-26)
(I. Ageyev) (Not translated)

FRG Tank Division (pp 27-28)
(V. Lyudchik) (Not translated)

AIR FORCES

Fighter Bombers in Combat (pp 29-35)
(V. Kirillov) 32

Air-to-Air Weapons for Helicopters (pp 35-37)
(V. Dmitriyev) 40

Training of FRG Air Force Crews in Canada (pp 38-39)
(S. Vasilyev) (Not translated)

Repair of Airfield Runways (pp 39-42)
(V. Chastukhin, V. Anisimov) (Not translated)

NAVAL FORCES

Improving U. S. Navy Surveillance Systems (pp 43-47)
(A. Markov) 45

The Giuseppe Garibaldi Light Aircraft Carrier (pp 47-49)
(S. Valyushin) (Not translated)

Automated Communications Systems of NATO Navy Surface Ships (pp 49-51)
(S. Kovalenko, Ye. Vostrikov, A. Balagurov) 51

U. S. Marine Corps Expeditionary Battalion (pp 52-53)
(A. Georgiyev) 56

CAPTOR Antisubmarine Mine (pp 53-55)
(I. Sukhanov, A. Kolpakov, P. Yevdokimov) 59

Check Your Knowledge. Antiship Missile Launchers (p 56)
(Not translated)

MILITARY ECONOMICS, INFRASTRUCTURE

Military Industrial Cooperation in NATO (pp 57-67)
(D. Nilov) (Not translated)

Military-Geographic Description of Belgium (pp 67-72)
(A. Alekseyev) 65

1986 Military Expenditures by the Scandinavian NATO Countries (pp 72-73)
(Yu. Shitov) (Not translated)

Conversion of Tankers into Hospital Ships (pp 73-74)
(N. Sterkin) (Not translated)

INFORMATION, EVENTS, FACTS

In Washington's Space Harness (p 75)
(Col Yu. Sedov) (Not translated)

U. S. 10th Light Infantry Division (pp 75-76)
(Lt Col I. Aleksandrov)..... 74

Hornet Fighter in Spanish Air Force (p 76)
(Lt Col P. Andreyev) (Not translated)

New Aircraft Delivered Mines (pp 76-77)
(Col S. Perov)..... 76

Changes in Plans for Purchase of Torpedos for the U. S. Navy (p 77)
(Capt 1st Rank Yu. Zhukov)..... 78

New System for Underway Transfer of Goods at Sea (p 78)
(Capt 2d Rank (Res) V. Mosalev)..... 80

FOREIGN MILITARY CHRONICLE (pp 79-80)
(Not translated)

MEETINGS WITH BALTIC TROOPS (p 80)
(Not translated)

COLOR INSERTS

Spanish Tereul-3 Multiple Launch Rocket System * New Italian Air Force Multi-Purpose Tornado Tactical Fighter * American C-141B Starlifter Military Transport Aircraft * C551 Giuseppe Garibaldi Light Aircraft Carrier

PUBLICATION DATA

English Title	:	FOREIGN MILITARY REVIEW, No 7, 1986
Russian Title	:	ZARUBEZHNOYE VOYENNOYE OBOZRENIYE
Author (s)	:	
Editor (s)	:	I. I. Bugrov
Publishing House	:	Voyenizdat
Place of Publication	:	Moscow
Date of Publication	:	July 1986
Signed to Press	:	9 July 1986
Copies	:	

EDITORIAL ON INTERNATIONALISM, UNITY OF PACT, ARMS CONTROL

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 3-6

[Unsigned Editorial: "Under the Banner of Internationalism"]

[Text] Year after year the positions of socialism are consolidated and strengthened and its might and authority grow. The 27th Congress of Lenin's Party became a truly sweeping review of the historic successes of the socialist community. It took place at a sharp turning point in the life of the land of the soviets and the modern world as a whole, demonstrated the great force of proletarian and socialist internationalism and became a vivid manifestation of the solidarity of all revolutionary forces in the struggle against imperialism and reaction.

The very fact that 152 delegations of communist, workers', revolutionary-democratic, socialist and other parties and organizations from 113 countries from all parts of the World took part in the work of the 27th CPSU Congress is a vivid indication of the tremendous force of internationalism. In the speeches of our foreign guests was heard the voice of millions of working people, who rendered its due to this event of tremendous historic importance.

The constantly growing friendship and cooperation of the Soviet people with the peoples of the fraternal socialist countries, and class solidarity with workers throughout the world, are creating favorable conditions for the accomplishment of the bold and real tasks of accelerating the social and economic development of the USSR and for socialist and democratic successes. The documents and ideas of the 27th CPSU Congress continued to arouse deep interest and to have a beneficial influence on the political atmosphere in the fraternal countries, and they inspire communists and millions of workers to work selflessly in the name of peace and social progress.

Mutual support between the victorious working class of our Soviet state and the proletariat of other countries in building a new society is becoming a most important part of proletarian internationalism and a tested and powerful means of fundamental transformation of life. Today it is no longer simply an ideological weapon of communists. Its real expression is the foreign political activity of the CPSU and the fraternal communist parties, which is having a decisive influence on the development of all mankind.

At various stages of history the Soviet state has been faced with different foreign policy tasks, which were always determined by the specific situation taking shape in the world. As this occurred, the main directions of Soviet foreign policy, advanced and worked out by V. I. Lenin, always remained unchanged and stemmed entirely from the socialist nature of our society and its ideals, and continuous support for those fighting for national and social liberation.

During the days of the Great October Socialist Revolution and the years of the Civil War, the working class of Russia, having raised the banner of struggle against world capital, united around itself all those who did not wish to be reconciled to the system of exploitation and oppression of man by man. "Our revolution," emphasized V. I. Lenin, "was a universal revolution, and we will solve our tasks with the aid of the workers and peasants of all countries" ("Polnoye sobraniye sochineniy" [Complete Works], Vol 37, p 73). The ideas of the Great October Socialist Revolution found fervent support in the hearts of millions of workers throughout the world. Their ideological unity and fraternal solidarity were tempered and strengthened in the fires of joint struggle against the common foe -- the worldwide bourgeoisie.

The young Soviet State, depriving itself of that which was most necessary, rendered extensive support to Soviet republics in Hungary, Bavaria and Slovakia. National liberation movements in the East also received effective assistance. The great ideals of proletarian internationalism and international solidarity of the working people were embodied in the joint actions of the workers against the exploiters. The heroic struggle of the Soviet people against Hitler's fascism and Japanese militarism was permeated with loyalty to its international duty to the workers.

A fundamental change has taken shape in the correlation of forces between capitalism and socialism in the international arena. In connection with the victory of socialist revolutions in a number of European and Asian countries and with the intensification of the world revolutionary process, capitalism entered the second stage of its general crisis and irreversibly lost power over a large part of mankind. The monopolistic bourgeoisie attempted, no matter what, to maintain its class positions and to create a united front of struggle against the socialist countries and the workers and communist movements within their own states, and against the liberation struggle of the oppressed peoples.

In this situation an objective need arose for the development of a unified program of actions by the fraternal countries, the objective of which was all-round strengthening of the socialist system and ensuring the reliable defense of revolutionary gains. This policy of the communist and workers parties met the fundamental vital interests, both of each of the states and of the entire system as a whole. Common concern about the present and future of socialism and communism were embodied in this policy.

With the origin of the world's socialist system, proletarian internationalism was filled with new content. In it there appeared features which reflect relations among the states of the victorious working class and among their

peoples. The class content of these relations was enriched still further. It is precisely in their subsequent development and growing unity and cohesion that the international class essence of the foreign policy of Lenin's party is vividly disclosed. As was emphasized at the 27th CPSU Congress, together with the fraternal countries we are building a new, socialist world, and an unprecedented type of relations among states, which are truly just, equal and mutually advantageous.

The tremendous achievements of the socialist world are organically linked with the operation of the principle of socialist internationalism within its framework. It is graphically displayed in the forms of political, economic and ideological cooperation tested in practice. The strengthening of their unity and development of all-round cooperation have a firm objective foundation -- a common socio-political system, ideology and final aims.

It is generally recognized, for example, that the successes in the economic development of the socialist countries are reliably ensured by fundamental advantages: public ownership of the means of production; a systematic, proportional development of the economy; socialist integration of labor and the principles of incentives and distribution. These and other obvious advantages of the new social system are realized owing to the international policy of the Marxist-Leninist parties, which exert leadership of social development on the basis of the conscious use of the economic laws of socialism, in accordance with the interests of the working class and all workers.

The Warsaw Treaty Organization became the embodiment of the unity and cohesion of the countries of the socialist community. With its creation began a new stage of cooperation among the fraternal countries, which is built on a multi-lateral basis. Our peoples and all progressive mankind see the main service of the defensive alliance as ensuring the peaceful, creative labor of their peoples. The achievement of military-strategic parity of the Warsaw Treaty Treaty Organization with NATO is a prominent achievement of socialism. "Maintaining this equality," it is emphasized in the new edition of the Program of the Communist Party of the Soviet Union, "is an important factor in ensuring peace and international security."

Joint exercises conducted according to plans of the Combined Command play an important role in strengthening the military cooperation and cohesion of the personnel of the allied armies. They demonstrate the high defense might of the socialist states and mobilize the personnel to defend the revolutionary accomplishments of the fraternal countries. Sharing advanced experience in training and indoctrination has been set up. Meetings, consultations and conferences conducted at various levels have become a good tradition. On these occasions urgent questions of further strengthening collective defense, and improving military cooperation and the activity of troop units and headquarters are discussed and resolved.

Multi-faceted party political work, carried out by political organs in the troop units of friendly armies, is aimed at strengthening military cooperation. Indoctrinating the troops in the spirit of socialist internationalism is viewed as one of the most important tasks of ideological

work in troop units and in the fleets. On this plane, political organs are constantly guided by the requirements of their Marxist-Leninist parties to give a decisive rebuff to any attacks of bourgeois propaganda, and to strengthen revolutionary vigilance.

As long as the real danger of war from imperialism exists, defense of the socialist homeland and the socialist cause is an objective necessity. "The CPSU," it is written in the new edition of the Party Program, "will make every effort to ensure that the USSR Armed Forces are at a level which excludes strategic superiority by the imperialist forces, that the defense capability of the Soviet state is improved in every way and that military cooperation by the armies of the fraternal socialist countries is strengthened."

A very important direction of the internationalist foreign policy of the CPSU is the growth and strengthening of USSR ties with countries liberated from colonial dependence. Through its consistent and principled foreign policy, the Soviet Union extends the hand of friendship to all peace loving states, who have relatively recently gained political independence and have already started or are just starting down the path of independent economic and social progress. Thousands of Soviet specialists are working selflessly in the countries of Asia and Africa on construction sites, in industry and agriculture and in educational institutions and hospitals.

The stronger the friendship of the peoples of the liberated countries with the socialist states, the more successfully they defend and protect their independence. Inspired by the successes of socialism and using their international assistance, the ruling revolutionary democratic parties are carrying out a policy of social renewal and are successfully overcoming the intrigues of reaction and open intervention by imperialism. In recent years the number of countries that selected the path of socialist orientation has increased. In these countries revolutionary parties, which reflect the interests of the broad popular masses, are growing stronger.

Liberating revolutions, started by the Great October Socialist Revolution, today define the face of the 20th Century. In our day the main content of the era -- the transition of mankind from capitalism to socialism -- finds expression in every class and liberation struggle. This stage is continuously improving social relations, purposefully multiplying those things which have been achieved and increasing the force and persuasiveness of its example. Socialism is thereby erecting an ever more stable barrier to the ideology and policy of war and militarism, reaction and force and to all forms of inhumanity, and is actively contributing to social progress. It has turned into a powerful moral and material force, and has shown what opportunities are being disclosed to civilization.

The Soviet Union and socialist community support the forces of progress. Loyal to principles of class solidarity, they constantly respond to requests for assistance from forces struggling against imperialism and for national and social liberation. The support which Soviet troops are giving to the struggle of the Afghan people is profoundly just in nature. The CPSU Central Committee political report to the 27th Party Congress states: "Counterrevolution and

imperialism turned Afghanistan into a gaping wound. The USSR is supporting the efforts of this country aimed at defending its sovereignty."

The CPSU is working actively to expand and extend further all-round cooperation with the political vanguards of the international communist and workers' movement -- the fraternal communist and workers' parties. Soviet communists rejoice in their achievements in expanding their ranks, strengthening their ties with the masses, defending the interests of all the workers, struggling to limit the power of monopolies, curbing the growth of militarism and in struggling for a socialist future development of their countries.

USSR internationalist policy is a most important condition for the successful opposition to the military danger engendered by imperialism. The CPSU is waging a successful struggle to solve tasks of tremendous importance for all mankind -- eliminating nuclear danger, fighting against the arms race and preserving and strengthening worldwide peace. This great objective is uniting and inspiring to active actions ever broader masses of people on all continents. Owing to the efforts of the fraternal socialist countries, and to their cohesion and will for peace, real prerequisites are appearing in our day for a decisive turn away from confrontation to cooperation. In accordance with the general strategic policy of the socialist community, the Soviet Union has put forth a radical, and at the same time a realistic program. It provides for the complete and universal elimination of nuclear weapons by the year 2000. The unity and cohesion of the fraternal socialist countries in implementing this program is of tremendous importance. A world without wars and without weapons is the socialist ideal.

However, these creative and peace loving plans do not suit the aggressive imperialist circles. They continue a policy of building up military might and using force in international affairs, attempting to achieve decisive military-strategic superiority over the USSR and the other Warsaw Treaty Organization countries, and obtaining the capability to make a first nuclear strike. The U. S. and its military-industrial machine remain the engine of militarism.

Being unable to offer the people a peaceful alternative which meets the interests of all, the ruling circles of the imperialist countries whip up militaristic psychosis which, by their design, may retard historic progress and help them to maintain economic and political power. "Moreover," as was emphasized at the June 1986 CPSU Central Committee Plenum, "they are hoping for the opportunity, even if illusionary, to interfere with the implementation of our plans, retard the development of the socialist countries, knock us off of the policy elucidated at the 27th CPSU Congress and maintain the fetters of the arms race."

The U. S. administration continues to rely stubbornly on naked force, on the "nuclear fist" and terrorism, mixed thoroughly in ideological intolerance and hatred. It continues to evaluate the present world situation in categories such as "star wars" and nuclear warheads, the arms race and imperialist blackmail.

Under these conditions, the Communist Party and Soviet government are carrying out a firm and consistent policy of peace, combining it with strengthening the defense capability of the country. They cannot permit the destruction of military-strategic parity or allow the NATO bloc to achieve military superiority, and they are doing everything necessary to ensure the security of the USSR and its friends and allies.

Strong in their international cohesion, the peoples of the socialist community are filled with optimism. It is based on the great achievements of the Soviet Union and the fraternal countries in building a new life and reliably defending the revolutionary gains of socialism. Soviet soldiers are filled with consciousness of their tremendous responsibility for the security of the homeland and the socialist cause, and for maintaining and strengthening peace on earth.

9069
CSO: 1801/4

DEFINING BASIC CONCEPTS OF U. S. NATIONAL SECURITY POLICY

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 7-11

[Article by Col B. Putilin, candidate of historical sciences: "What is Behind U. S. National Security Policy"]

[Text] The CPSU Central Committee Political Report to the 27th Party Congress notes: "Imperialism, due to its social nature, constantly generates an aggressive, adventuristic policy." This is particularly clearly manifested at present, when through its fault there has been a sharp exacerbation of the international situation. The United States is initiating a new spiral in the arms race and is attempting to extend it into space. The American administration ignores, and at times even directly flouts the interests of different countries and peoples, and openly claims the "right" of armed intervention in the affairs of other states, under the pretext of ensuring its "national security." This policy was officially set down back in 1947 in the U. S. National Security Law.

For almost 40 years the policy of "ensuring national security" was continuously supplemented and expanded by virtually all American presidents who followed one another in these years. In its essence this policy represents the theory and practice of the struggle by American imperialism for world domination and to preserve and strengthen the capitalist system. U. S. ruling circles, attempting to conceal its reactionary imperialist essence, emphasize in every possible way the "national" character of the political policy of the most aggressive Western state. They identify the narrow, selfish aspirations of the exploitative class with the fundamental interests of the American people.

U. S. "national security" policy pursues the specific objective of achieving absolute security for the United States, in so doing placing all other countries and peoples in a position of absolute danger. It is distinguished by extreme aggressiveness and expansionism, called upon to secure the global objectives and interests of American imperialism, and its practical implementation is viewed most of all through the prism of coercion. In accordance with this policy, the use of all forms and methods of coercion against other states is envisioned: from "psychological warfare" and economic sanctions to armed intervention and state terrorism.

According to the 1947 law, "ensuring national security" assumes combining efforts in foreign, domestic and military policy to achieve the objectives of American imperialism. However, reliance on force prevails in this process and stipulates the priority of the latter. It also defines the leading role of military doctrine in the whole system of officially accepted views on ensuring U. S. "national security."

American military doctrine has a clearly expressed aggressive nature and serves the interests and objectives of the imperialist circles. Its socio-political aspect has always had a reactionary, anti-democratic thrust and virtually reflects the ideology of the ruling class. Basic in the military-technical side of doctrine is the constant aspiration of American ruling circles to have military superiority over any enemy, which, in their opinion, ensures the "absolute security" of U. S. global interests.

The military-political and military-strategic aims of American military doctrine stem entirely from the provisions of the policy of "ensuring national security," one of the main features of which is U. S. readiness to apply military force in conflict situations which it has created. However, it is emphasized in official documents for propaganda purposes that the armed forces are assigned the functions of "deterrence" and "defense." The former assumes the planned and gradual coercion of an enemy to act under American conditions, under the threat of the use of force. "Defense," according to official U. S. documents, signifies the direct use of armed forces (with and without a declaration of war). Another important feature of the doctrine is the fact that the military departments can be involved in carrying out ideological, economic and political coercion.

The military-strategic aims of the doctrine stem from requirements about the defense of American "national interests." U. S. armed forces are involved mainly in ensuring so-called vital interests and survival. Survival is associated with struggle against the Soviet Union and the "destruction of socialism as a social and political system," which represents, according to ruling American circles, "the greatest military threat to the interests of the United States." Vital interests also include American foreign policy and foreign economic positions, the undermining of which could seriously damage U. S. security and well-being.

At the present stage, the U. S. military and political leadership, taking into account the demands of trans-national monopolies, represent "regional conflicts" as a threat to their "vital interests." The so-called "doctrine of neo-globalism" (also called the "Reagan Doctrine") became the theoretical basis for this change. It envisions whipping up centers of tension and expanding crude intervention, mostly with the use of military force, in the internal affairs of the liberated states.

In accordance with this doctrine, the U. S. "right" to armed intervention is openly claimed, under the guides of combating terrorism, in those areas of the world where Washington sees a "threat to the national interests" of the United States. Declaring terrorism a "type of war, aimed at undermining U. S. national security," the Pentagon leaders and Department of State are

implementing the concept of "counter-terrorism," which includes both open and secret use of armed forces, which could participate in preventive actions against terrorists and their infrastructure, and against the states serving as their guardians. In fact, crises and conflicts are fertile soil for international terrorism.

In accordance with the policy of "ensuring national security," all countries are divided into enemies and allies of the United States. For more than 40 years already U. S. ruling circles have seen the USSR as the main enemy, the "superpower," to the elimination of which from the world arena all military organizational development and planning are subordinated. With respect to the states of the socialist community and the progressive liberated states, along with direct military intervention in these countries, undermining them from within is envisioned, through the use of armed counterrevolution and the threatened use of force.

U. S. allies are assigned an important place in the struggle for world domination. The American military and political leadership considers military-political blocs and bilateral agreements to be the main instrument for uniting them on an anti-communist and anti-Soviet basis. Washington places priority importance on four multilateral groupings. NATO; the Rio Pact, uniting the countries of Latin America; ANZUS (U. S., Australia and New Zealand) and SEATO, which virtually ceased to exist in 1975, but which retained its political foundation. The U. S. has bilateral "security treaties" with Japan, South Korea and the Philippines, as well as agreements and commitments of a military nature with approximately 30 other countries.

In the late 1970s the principle of "partnership" was placed at the foundation of coordination with allies. Accordingly, the Pentagon promised to provide a "nuclear shield" for its allies, and the latter were to be prepared to wage conventional wars using their own forces, with military and economic support from the United States.

Implementing a policy of total confrontation, the Reagan Administration is striving to replace the principle of "partnership" with that of "strategic partnership with the leading role of the United States." Washington's efforts to establish new, regional military and political blocs along the eastern and southern borders of the Soviet Union became more active. For example, the "Pacific community" could become the eastern equivalent of NATO. In the south the Reagan Administration is trying to turn the cooperative council of Persian Gulf Arab States into yet another military and political bloc, which would be aggressive in nature. An important element of "strategic partnership" is the further development of cooperation with "strategic allies" in the area of the liberated states. These include, in particular, Israel, Pakistan, the UAR and Honduras. The "leading role" in the framework of "strategic partnership" assumes complete subordination of the allies to the United States. Even their closest NATO allies must, Washington believes, be subject to strict discipline, established and zealously maintained by the current U. S. administration.

Military theoreticians, classifying wars and defining their nature, begin from a so-called "general theory of conflict," which lumps together all possible

forms of abstractly understood social conflicts: a clash of individuals; fights between monopolistic competitors; the struggle of the workers against capital; civil wars, putsches and coups, and wars between states, irrespective of their specific historical and socio-political nature. In accordance with this theory, war is merely a stage, a level of conflict, and its emergence the result of the "escalation" of conflict. Recent statements by U. S. leaders emphasize that U. S. "national" policy for the long term is oriented on "the most varied conflicts, which occupy an intermediate position between large scale war and general peace." In accordance with the general theory of conflict, wars are classified by scale (general and limited), weapons used (nuclear and conventional) and intensity of military operations (high, medium and low intensity).

Since the early 1980s official American military sources have distinguished five types of war: general (nuclear and conventional); limited (nuclear and conventional within a theater of war, usually in a TVD [Theater of Military Operations] or a limited region of a TVD). According to level of intensity, nuclear wars are high intensity conflicts and general conventional wars and conventional wars within a theater of war are medium intensity conflicts. Conventional war in a TVD and the participation of American troops in internal conflicts of other countries are elements of "low intensity conflicts." Sometimes the latter imply a situation in which opposing groupings are struggling for political control, combining military and political actions.

The nature of limited wars, according to American military theory, is determined by limitations which are supposedly introduced by the U. S. military and political leadership in terms of the objectives, weapons used, objects of destruction and geographic scope. In "low intensity conflicts," according to a statement by U. S. Secretary of Defense C. Weinberger, American armed forces have only one mission -- total victory over the enemy.

The defense of U. S. "national interests" presumes the need to maintain armed forces which must accomplish total "deterrence" and "defense." Moreover, it stipulates the deployment of forward groupings of American troops and naval forces in various areas of the world, most of all along the borders of the Soviet Union (the concept of "forward lines"), the creation of a powerful strategic reserve and increasing the capabilities for rapid reinforcement of forward groupings of armed forces or the deployment of new groupings in areas where there is no continuous American military presence.

Throughout the entire post-war period (and especially at the present stage) a clear tendency can be traced in the organizational development of the U. S. armed forces toward the creation of more modern weapons than those of the enemy and toward their maximal use for the achievement of military-strategic objectives. The Reagan Administration is devoting particular attention to improving strategic offensive forces and to creating conditions for "guaranteed survival" in case of nuclear war. The capabilities of all strategic offensive force components to make a first "preemptive" strike are being supplemented in every possible way by deploying intermediate range nuclear weapons (Pershing-2 IRBMs and cruise missiles) in Western Europe. What is in fact a new component of American offensive forces is being created

along the USSR borders, which may become the main means of conducting nuclear strikes within the theater of war.

U. S. general purpose forces, besides being equipped with a growing number of nuclear weapons and high-precision conventional weapons, are being improved qualitatively and increased quantitatively. Light divisions are being developed in the U. S. Army and divisions, brigades and regiments are being equipped with air-transportable armored vehicles and various helicopters, which significantly improve their mobility. The allocation of part of the strategic reserve into the "rapid deployment force" and planned changes in the correlation of "light" and "heavy" divisions have significantly increased the ability of U. S. Armed Forces to participate in "low intensity conflicts." The development of a more powerful Navy (up to 600 combatant ships) will make it possible, in the opinion of the U. S. Navy command, to conduct successful combat operations in any area of the world's oceans. Besides the growth of the U. S. Air Force tactical aircraft fleet, the appearance in inventory of more modern multi-purpose fighters, increased intensity in the use of aircraft and improvement in the command and control system are having a substantial influence on increasing their military capabilities.

The aggressive and adventuristic nature of American military doctrine is manifested with particular force in its aims of unleashing war by surprise. As B. Brody, the American military theoretician, wrote, in this case "the attacking side may reduce to a permissible minimum the damage caused to it, while at the same time inflicting militarily irreparable damage upon the enemy." In his opinion, such an outcome portends total victory to him who attacks first. As can be seen from foreign press reports, in the practice of operational and military training of the armed forces of the U. S. and its allies, the most probable methods of unleashing wars are: surprise attacks by combat ready groupings in peace time or transition to military operations following secret mobilization.

A "lightning" preemptive strike, in the opinion of the American command, is the main content of the initial operations in any type of war. It makes it possible to seize and hold the strategic initiative. Combat operations can be waged successfully only under conditions in which the problems of the comprehensive defeat of the enemy and the increasing spatial scope of offensive operations are solved. In connection with this, the Pentagon approved a new concept, the "air-ground operation (battle)."

With the introduction of the new FM 100-5 field manual in 1982, the principle of tactical mobility in the organization and conduct of military operations has taken on special importance. Under conditions in which the enemy is struck throughout the full depth of his operational formation, maneuver by forces and weapons will make it possible, in the opinion of American military specialists, to achieve success in an operation by moving to the enemy flank and rear and thereby crushing his will to resist. As a result of this, the main strike must be made against the most vulnerable places, the so-called "operational windows," which arise as the result of destruction in depth.

In recent years certain changes have been noted in American military doctrine on questions of preparing the country for war. A policy has been implemented

toward ensuring the capability for waging a protracted general nuclear and conventional war. According to "studies" which have been made it has been determined that the United States can survive a nuclear conflict with permissible losses (up to 40 million people) and, thereby, "win" the war. To reduce losses in such a war it has been recognized as advisable to continue to develop passive population protection measures, in connection with which $4 billion was allocated for the construction of bomb shelters.

Fundamentally new in this posing of the question (winning the war) was the doctrinal aim of the Reagan Administration to create space strike weapons. One of the most important steps in this direction was the adoption of the "star wars" program. Even former U. S. Secretary of Defense MacNamara acknowledges that a large scale space based system will become an addition to the huge arsenal of offensive weapons which exists in the U. S. Such a system is aimed at maintaining the most important enemy targets constantly in sight and ensuring U. S. invulnerability after it makes a first nuclear strike.

The ideological preparation of the U. S. for war is determined by the doctrinal requirement of ensuring popular support for military actions and achieving "national unity." It is based on the idea of the exclusiveness of the "American social system," as well as on intensified militarization of the political thinking in the country. To ensure popular support for the Pentagon's military ventures, it is considered necessary to emphasize in every possible way the ideological incompatibility with the probable enemy (the socialist countries), as well as the unavoidability of the use of American armed forces. This resulted in the appearance in speeches by American officials of such expressions as a "crusade against communism," "the USSR -- the evil empire," etc. Chauvinistic campaigns on various pretexts are regularly conducted in the country. These pretexts include the opening of the monuments to American soldiers killed during the aggression in Vietnam; the celebration of the anniversary of "victory" of Grenada, etc. The mass media also promotes militarism in all layers of the population.

The more the course of historical development saps the positions of imperialism, the more hostile the policy of its most reactionary forces is becoming to the interests of the peoples. The policy of "ensuring national security" reflects most fully how far militarization of political thinking in the United States has come. Soviet military theory, in contrast to American, is entirely based on a policy of peace. The party is doing everything possible to halt attempts and plans by U. S. militarism to solve militarily the historic dispute between the two opposing social systems. This defines the thrust of Soviet military doctrine. "The CPSU," it is stated in the Party Program, "will make every effort to see that the USSR Armed Forces are at a level which prevents the forces of imperialism from attaining strategic superiority."

9069
CSO: 1801/0004

CRITIQUE OF COMMAND AND CONTROL OF U. S. STRATEGIC FORCES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 11-13

[Article by I. Kulkov: "Unauthorized Nuclear War is Possible"]

[Text] The catastrophe of the American Challenger spacecraft showed that plans for deploying weapons systems in space are fraught with deadly danger to mankind. At the same time, it again attracted attention to the question of the reliability of the latest technical means of command, control and communications. Many American political figures, as well as specialists, note that difficulties and interruptions in these systems may cause an unauthorized nuclear war to arise. This problem is examined in Daniel Ford's book, "The Button. The Pentagon's System for Command and Control of Strategic Forces," published in 1985 simultaneously in the U. S., Great Britain and Australia. Its author is a scientific associate at Harvard University.

The book brings out numerous facts, documents and statements by American political, public and military figures and scholars about the structure, operating mechanism, capabilities and "weak points" in the strategic forces command, control and communications system. Ford had the opportunity to visit personally a number of command posts and see for himself that the "nuclear trigger" is imperfect. To prove this the author brings up a number of recent examples.

Early in the morning on 3 Jun 80 a signal suddenly passed through technical communications means of the North American Air Defense Combined Command: "Soviet ballistic missiles are approaching the U. S." The Strategic Air Command Headquarters immediately ordered B-52 bomber crews to take off. Minuteman missiles were brought to immediate launch readiness. A corresponding report was sent to Washington. And suddenly the marks for "approaching Soviet missiles" on the display disappeared as suddenly as they appeared.

This time the "nuclear trigger" did not work. It was established that difficulties in one of the elements of the detection and notification system had occurred. But, the author emphasizes, there have been many such false alarms. In particular, the book brings up a case when U. S. reconnaissance satellites "located the launch of an intercontinental ballistic missile in the

USSR." Soon it became clear that this was a gas flareup at one of the oil fields in western Siberia.

In the past years 630 nuclear weapons incidents have been registered in the U. S. A report prepared by a Senate Congressional commission indicated that from January 1979 through June 1980 alone false alarm signals occurred approximately 150 times. The British newspaper GUARDIAN wrote: "In 1983 every three days an average of two false signals about the initiation of nuclear war occurred."

The present U. S. military command and control system, Ford concludes, does not ensure reliable control over the employment of the country's nuclear forces. In other words, mankind may be plunged into nuclear catastrophe as a result of an error in the functioning of American technical command, control and communications systems or as a result of an incorrect interpretation by officials of strategic military information obtained through technical means. When the author received permission to visit a command post near Colorado Springs he was initially amazed at the grandiose scale of the subterranean facility and the numerous latest model apparatuses located therein. However, an attempt by the general on duty to communicate with Washington, at Ford's request, was not successful.

According to an assessment by former U. S. Assistant Secretary of Defense W. Perry, American leaders are not completely confident that the existing detection and notification system "will not give false alarms." Doctor D. Steinbruner, director of the Brookings Institution Center for Foreign Policy Studies, came to the conclusion that "it is doubtful that anyone will be able to control" this technical system in an emergency. In the opinion of Lt Gen N. Dickinson, much time and effort will still be required in order to eliminate the "weak points" in the system, of which there are "so many."

Ford's book brings up information which indicates the imperfect nature of technical means of command, control and communications between the Pentagon and nuclear missile submarines, especially of the special TAKAMO system communications relay aircraft. Due to the technically imperfect system of strategic command and control, American physicist G. York believes the deployment of such great nuclear power in the world's oceans "without reliable control," entails obvious danger. It does not exclude the possibility of a missile launch unauthorized by the President.

Thus, Ford asserts in the concluding chapter of his book that the condition of the American "nuclear trigger" must give serious pause, all the more so in that some military personnel -- war hawks -- have an exaggerated idea about the advantage of a preemptive nuclear strike. The author includes statements by a number of representatives of the U. S. high command, which make clear that the idea of a preemptive strike has always been part of U. S. military doctrine.

The tragedy, the author writes, is in the paradoxical split which has long existed in this country. The political leaders in Washington publicly express "defensive doctrines," but the generals are in practice preparing to make a first strike. As D. Meyer emphasizes in his review of this book (contained in

ARMED FORCES JOURNAL, July 1985), Ford has succeeded in convincingly disclosing the obvious "vulnerability" of technical systems and in proving that the U. S. President may even be unable to make a decision, for war may arise without his will and participation. And if one considers that the American "nuclear trigger" is imperfect, then people are justified in fearing the possibility that an unauthorized nuclear war may arise.

One must agree with this. You see, the truth is that the chimerical plans of American "hawks" to secure U. S. strategic military superiority over the USSR stimulate the arms race. A huge, far-flung system of strategic command and control has been created in the country, which suffers from technical imperfection that increases the possibility that the "nuclear genie" may get out of control of the U. S. political leaders and push the world to the brink of catastrophe.

Ford's book reflects the mood of that part of healthy minded America which ever more loudly and persistently favors negotiations with the USSR to limit and reduce strategic weapons and create a reliable international system of weapons control. At the same time, the book has been written and published from funds and in the interests of military industrial corporations which manufacture electronic equipment. Its true objective is to prove to the American public the inadequate effectiveness of U. S. systems for military command and control of nuclear forces and to justify the need for a sharp increase in expenditures to improve them. Critical statements concerning the Pentagon leadership, which is developing plans for a preemptive strike against the USSR, give the appearance of authenticity to the information brought out by the author. The popular depiction in the book of such complex military-technical issues is calculated to make them accessible to the American public at large and to enlist its support in the development of new militaristic programs.

9069
CSO: 1801/0004

BUNDESWEHR TANK DIVISION IN THE OFFENSIVE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 15-20

[Article by Col A. Yegorov, docent, candidate of military sciences: "Bundeswehr Tank Division in the Offensive"]

[Text] Militaristic circles in the FRG, continuing to build up military preparations aimed against the Soviet Union and other states of the socialist community, are equipping their armed forces with modern weapons and military equipment and taking steps to improve further the organizational structure of their large units, units and small units and to raise the level of operational training of staffs and field training of troops. Simultaneously, a great deal of attention is being paid to developing new forms and methods of conducting military operations to use more fully the increasing capabilities of combined arms formations. An indication of this is the Bundeswehr publication in recent years of a number of regulations and manuals setting forth views on the organization and conduct of offensive and defensive operations under modern conditions.

West German military specialists view the offensive as the main type of combat operations, as a result of which enemy troop groupings are destroyed, his territory is seized and his will to resist is crushed. It is believed that offensive operations must be based on capable exploitation of the results of both nuclear and conventional weapons, especially high-precision weapons. In their view, the offensive goal is achieved by thorough study and correct assessment of the enemy; concentration of the main troop efforts on the main axis; organization of careful command and control of branches of arms; conducting fire destruction to the full depth of the enemy defense; capable combination of maneuver of troop units and weapons; uninterrupted command and control and organization of continuous combat support and rear services support.

The Bundeswehr command considers tank troops to be the most suitable branch of arms for conducting combat operations when modern means of destruction are used. They are able to carry out a battle of maneuver immediately after strikes have been made against the enemy and to implement an offensive at high tempos.

As the foreign press notes, Bundeswehr tank troops most completely meet the requirements for waging modern combined arms combat and are considered the main strike force of the ground forces. Organizationally they consist of tank divisions, brigades, battalions, companies and platoons. Tank large units and units can be used both in coordination with other branches of arms and independently. In offensive combat they will be used mainly to develop success and pursue a withdrawing enemy.

According to latest foreign press reports, a tank division includes a command group, a headquarters and headquarters company, two tank brigades, a motorized infantry brigade, an artillery and an anti-aircraft artillery regiment and other combat support and service support subunits. It contains more than 300 tanks, approximately 400 BMP [infantry combat vehicles], BTR [armored personnel carriers] and BRM [armored reconnaissance vehicles], more than 100 field artillery guns and mortars, approximately 160 ATGM [antitank guided missile] launchers and other military equipment.(1) A division operating on the main strike axis may be reinforced with 2-3 artillery battalions, a squadron of anti-tank helicopters, engineer subunits and transport helicopter subunits. It is envisioned that up to 80-100 tactical aviation sorties per day of combat will be allocated to support its combat operations.

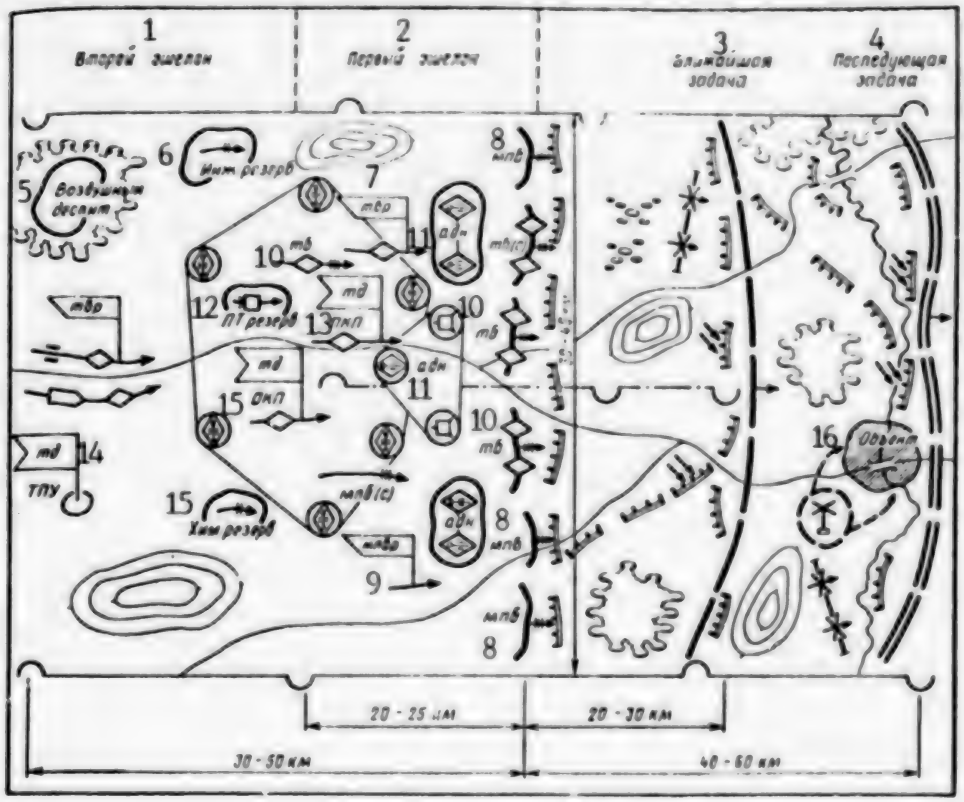
Fundamentals of Offensive Combat. According to Bundeswehr regulations, a tank division is organized and conducts combat operations, as a rule, as part of an army corps, supported by its fire weapons, and is located in its first or second echelon (reserve). In some cases it may attack independently on a separate axis or be in the NATO OVS [Combined Armed Forces] army group reserve.

Judging by Western press reports, a tank division operating as part of an army corps may play different roles, which are determined by its mission, place in the corps combat formation and the offensive axis. Thus, a division which is in first echelon and is operating on the army corps main strike axis fulfills the main mission of achieving the offensive objective. In this case it may attack a previously prepared or hastily occupied enemy defense. If it is located in second echelon (reserve) it mainly facilitates the successful development of the offensive.

For a division offensive a zone is indicated, the width of which, in the opinion of foreign military specialists, is determined by the nature of the defense and the military capabilities of the enemy to wage the defense; the assigned combat mission; peculiarities of the terrain and the composition of its own troops and reinforcements. It is believed that usually it may be 30-40 km. When operating on the corps main strike axis it may be 20-30 km (breakthrough sector of 3-6 km). The brigade zones may be 10-15 km.

The foreign press notes that the tank division's combat mission is determined by order of the corps commander, depending on his offensive concept; the force grouping; nature of operations and the enemy defense; terrain relief conditions; the division fighting strength and its role and place in the army corps combat formation. It is divided into the immediate and subsequent

mission. The immediate mission, according to exercise experience in recent years, is to destroy the enemy first echelon large units and seize a line a



Structure of Tank Division Formation in the Offensive (Variant) [FRG]

Legend:

1 - 2d echelon
2 - 1st echelon
3 - immediate mission
4 - subsequent mission
5 - air assault
6 - engineer reserve
7 - tank brigade
8 - mechanized infantry battalion
9 - mechanized infantry brigade
10 - tank battalion
11 - artillery battalion
12 - antitank reserve
13 - forward command post (tank division)
14 - rear control post (tank division)
15 - separate command post
16 - objective

depth of 20-30 km from the forward edge. The subsequent mission is to develop success, complete the breakthrough of the defense to the full tactical depth within the division offensive zone and seize a line at a depth of 40-60 km. The depth of the immediate mission of a first echelon brigade is 10-20 km and that of the subsequent mission is 20-30 km.

West German manuals indicate that the combat formation of a tank division in the offensive must be structured based on the assigned combat mission; the width of the offensive zone; combat capabilities of the brigades and nature of the terrain. It must also take into account opportunities for timely and effective exploitation of the results of tactical air and other fire strikes. It is envisioned that it will ensure a powerful initial strike to achieve decisive success at the outset of offensive operations.

Bundeswehr specialists assert that the combat formation of a tank division may be structured in two echelons or one echelon with a reserve (up to a reinforced tank battalion) (see diagram).

The two echelon combat formation is considered most effective. It is recommended that the first echelon be stronger, to make a powerful strike and fulfill the immediate mission in a timely manner. It may include a tank and a motorized infantry brigade, reinforced with artillery. The second echelon is to be used to build up the efforts of the first echelon and accomplish the subsequent mission, or to repulse enemy counterattacks, as well as to replace units operating in the first echelon when they have lost combat effectiveness. It includes a tank brigade, which usually moves on two routes a distance of 20-30 km from the forward edge, prepared to accomplish missions which arise during the division offensive battle. A single echelon division structure is usually implemented when attacking an enemy who has hastily shifted to the defense, and if terrain conditions allow.

Field and air defense artillery groups, reserves (anti-tank, engineer, chemical) and a tactical air assault are also elements of the combat formation.

The field artillery grouping includes organic and attached forces and weapons. It is assigned missions of fire support of the operations of units and subunits at all stages of the offensive, and during the commitment of the second echelon (reserve) and air assault landing. Thus, the artillery regiment occupies firing positions mainly on the axis on which the main division efforts are concentrated (4-6 km from the forward edge). The artillery of the brigades is located directly behind the first echelon battalions (2.5-3 km).

The division air defense artillery grouping (organic air defense artillery regiment) covers command posts, field artillery firing positions, communications centers, etc., from enemy air attack. Some of its forces and weapons may be attached to the first echelon brigades to combat aerial targets right in the combat formations of the attacking subunits.

The anti-tank reserve may include an anti-tank company or a tank subunit from the second echelon brigade. During the offensive it moves behind the combat

formations of the first echelon brigades and is assigned to reinforce their anti-tank capabilities and repulse counterattacks by enemy tank units and subunits. If a squadron of anti-tank helicopters is attached to the division it is included in this reserve.

The engineer reserve is assigned to lay obstacles when repulsing enemy counterattacks; cover open flanks and gaps in the combat formations of friendly troops with engineer obstacles and support the commitment to combat of the second echelon (reserve). This may include engineer, ponton bridge and other subunits.

The chemical reserve is used to lay camouflage smoke screens; reconnoiter contaminated terrain sectors and conduct radioactive and chemical decontamination of weapons and military equipment and personal cleansing of the troops in case of enemy use of nuclear or chemical weapons. It includes an OMP [weapons of mass destruction] defense company.

During ground forces exercises all reserves usually move behind the division first echelon on axes planned for their use.

A tactical air assault (as a rule a motorized infantry battalion from the second echelon brigade) may be landed at a depth of 20-40 km with the mission of destroying important objectives in the enemy rear and seizing and holding advantageous lines, terrain sectors, crossing sites over water obstacles, etc., until the arrival of friendly troops. Assault landings may be conducted at the outset and during the offensive. Until they are thrown into the enemy rear they are located in the vicinity of the division second echelon. The assault operation is carried out by subunits of army aviation helicopters.

The overall depth of a tank division combat formation, when structured in two echelons, is 30-50 km.

Offensive Operations. The West German military press notes that a tank division may shift to the offensive under various combat conditions, from the march and from a position of direct contact with the enemy.

It is planned that an offensive from the march will be organized and conducted directly from concentration areas located 30-80 km from the forward edge of the defense, or from permanent deployment locations, without occupying subsequent concentration areas (recently this method has been worked on more and more often during ground forces exercises). Foreign specialists believe that under modern conditions the offensive from the march in the initial period of war will be the main method, since it helps achieve surprise and reduces friendly losses from enemy fire.

An offensive from direct contact with the enemy is to be used in cases when the enemy shifted to the defense in advance or when defensive operations preceded the offensive. Under this method, in the opinion of foreign military specialists, it is possible to study the defending enemy grouping and terrain more carefully and thoroughly, as well as to create conditions for a simultaneous attack of the enemy forward edge by all division forces and resources.

Bundeswehr regulations note that, regardless of the method of shifting to the offensive, the division is assigned the mission of breaking through the defense, seizing important objectives in the enemy rear and creating conditions for the development of success, through fire from all weapons and a strike by the main forces on the decisive axis. It is recommended that terrain conditions be properly used; camouflage and electronic warfare be widely employed; the enemy be confused about the true intentions; his command and control be disrupted; he be deprived of the opportunity to conduct active reconnaissance and that the composition of the friendly force grouping and start time for the offensive be concealed. It is considered that under modern conditions the main forms of division maneuver in the offensive will be a frontal strike and envelopment.

In the opinion of the Bundeswehr command, conducting a frontal strike makes it possible to accomplish the combat mission of breaking through the enemy defense rapidly and seizing the attack objective. In carrying this out it is assumed that there will be a significant superiority in personnel and equipment and that the breakthrough of the defense will be conducted on a narrow sector (3-6 km across the front). At night it is envisioned that several breakthrough sectors will be planned, used for "infiltrating" subunits into the depth of the defense.

It is expected that the envelopment will be implemented by making the main strike against an open flank of the enemy defense and enveloping his main grouping. The attacking troops are assigned the mission of seizing important objectives in the depth of the defense, blocking withdrawal routes and destroying the enemy, in coordination with troops making a secondary strike from the front.

According to views of the Bundeswehr command, there are three stages of division offensive operations: advance to contact, breakthrough of the defense, and battle in the depth of the enemy defense.

Advance to contact is carried out when the division moves from the depth to conduct the offensive. It will occur most often during an attack from the march and during combat operations in the initial period of war. The objective of the advance to contact is to establish or reestablish direct contact with the enemy, and it involves movement of the main forces from the concentration area in march formations, deployment and movement to the line of attack.(2)

The breakthrough of the defense includes suppressing enemy troops, fire weapons and troop and weapons command and control posts, especially in the breakthrough sector, making a powerful strike and creating gaps in the enemy defense.

West German specialists believe that one of the most important conditions for success in breaking through the defense is concentration of required forces and resources on selected axes to achieve required superiority over the enemy. When attacking with conventional weapons, it is recommended that this superiority over the defenders be on a narrow front and on that axis where the

enemy defensive system is weakest and has vulnerable places. This is to be achieved mainly by surprise, able maneuver and swift troop operations.

Immediately before the division shifts to the offensive a fire preparation is conducted by organic and attached weapons and weapons of the senior commander, and strikes by tactical and army aviation are made in the interests of the division. The fire preparation may last for 20-30 minutes, and sometimes 50-60 minutes. Its main objectives are the following: to disrupt the prepared enemy fire system; destroy his means of nuclear attack; knock out troop and weapons control posts; suppress fire weapons; and strike personnel in strong points and enemy reserves. It is believed that a well organized fire preparation can facilitate the successful accomplishment of the missions assigned to the division. Upon its conclusion the subunits of the first echelon brigades, having moved to the attack line, shift to the offensive. In view of the great dispersion of the division across the front and the depth it is assumed that when necessary different lines and a different time for shifting to the attack will be designated for the different units. However, it is recommended that the forward edge of the enemy defense be attacked simultaneously by all forces of the division first echelon brigades which, in the opinion of foreign specialists, will substantially reduce the enemy ability to concentrate fire against them.

The offensive is to be implemented by the method of consecutive seizure of strong points. It is to be conducted swiftly and at a high tempo, in order to disrupt the integrity of the defense quickly, disorganize the enemy, destroy his main fire weapons, defeat counterattacks and seize and hold initiative in the battle.

As the first echelon subunits advance, artillery and other fires are shifted into the depth. Direct support of the attacking troops is conducted by artillery subunits following behind the brigade first echelons.

It is recommended that subunits be echeloned when breaking through the enemy defense. It is believed that this distribution of forces and resources will facilitate building up efforts to solve assigned missions and maintain continuous contact with the enemy. Important in this stage of the offensive are precise command and control of division units and large units and close coordination with supporting forces and resources, forces operating in the division's interests and within the echeloned subunits.

According to the West German command, battle within the depth of the enemy defense will be highly maneuver-oriented and various tasks may suddenly confront the troops. They may have to seize individual strong points, repulse counterattacks by enemy reserves, negotiate consecutive defensive positions, etc. In connection with this, it is recommended that units carry out required regroupings as rapidly as possible, concentrating the main efforts on the most important axes, as well as react in a timely manner to changes in the situation. It is intended that first echelon units not be drawn into protracted battles, but advance at a high tempo from one objective to another. The elimination of individual centers of resistance is assigned to second echelon (reserve) subunits and units. All barriers and obstacles are to be

negotiated on a broad front, from the march and by surprise. This should be preceded by continuous and active reconnaissance of all types.

Hasty crossing of water obstacles in the depth of the defense, on a wide front, with the use of camouflage and the conduct of demonstrations to confuse the enemy about the true crossing sites is recommended.

To support high offensive tempos in the depth of the defense a tactical air assault in up to company strength to a depth of 15 km or more may be landed on behalf of the first echelon brigades, and a tactical air assault of up to battalion strength to a depth of 40 km on behalf of the division.

It is recommended that the division second echelon be committed to combat after the division has accomplished the immediate mission and seized the first defensive zone of the enemy large units, to develop the success of the offensive, and in some cases also to repulse enemy counterattacks. It is considered most advisable to commit it to combat in the gaps between the combat formations of attacking units or from their flanks. Commitment is implemented from the march and is supported by strikes from air, artillery and anti-tank helicopters, as well as other means.

According to the foreign press, a tank division which has accomplished its subsequent mission may consolidate on the line achieved and support the commitment to combat of the army corps second echelon (reserve), or it may develop the success of the offensive, which is carried out across a broad front to seize objectives and advantageous lines in the enemy rear and to encircle and destroy his reserves. In the opinion of the Bundeswehr command, the offensive tempo of a tank division in the tactical zone may be 25-30 km per day, and it may reach 45-50 km in the operational depth.

FOOTNOTES

1. For more detail on the organization and weapons of a tank division see pp 27-28.

2. For more detail see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1986, No 3, pp 19-25.

9069
CSO: 1801/4

COMBAT HELICOPTERS OF NATO ARMIES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 20-24

[Article by Lt Col V. Nelin: "Combat Helicopters of NATO Armies"]

[Text] In modern military strategic concepts of the NATO countries (especially the U. S.) which define the use of armed forces in future war, an important role is assigned to general purpose forces, and in particular to their largest component -- the armies. In accordance with the American concept of the "air-ground operation (battle)" and similar NATO concepts of "combat against enemy second echelons," armies must possess high maneuverability, the ability to inflict deep fire destruction on the enemy and shift rapidly from one type of combat operations to another and the ability to use terrain and various tactical techniques and methods to accomplish combat missions. In the opinion of American specialists, army aviation, to a large degree, meets these requirements.

Ascribing great importance to further developing and enhancing the military capabilities of army aviation as a whole, by improving the organizational structure and tactics of units and subunits, and by equipping them with new aviation equipment, the NATO army commands are paying particular attention to combat helicopters, as they consider them a primary strike force of this branch of arms. A combat or strike helicopter (attack helicopter [English in original text]) is understood as an aerial means of weapons delivery employed during the conduct of offensive military operations and in the defense. Its main mission is combating tanks(1), however it can also be used to destroy other armored targets, make strikes against dispersed combat troop formations and various small and area targets. In the future, such helicopters will also be assigned missions of combating enemy helicopters and fixed-wing aircraft.

A characteristic feature in the development of combat helicopters in the NATO armies, the foreign press reports, is the qualitative renewal of their fleet through modernization and improving the combat effectiveness of existing models, and creating new generation machines based on the latest scientific and technological achievements. In the first instance, the main efforts are concentrated on equipping helicopters with an apparatus for operations at night and under difficult meteorological conditions, as well as on improving organic armament.

The creation of new generation combat helicopters is conducted along the following lines: developing better designs and improving tactical and technical specifications; increasing survivability; extensive use of modern electronic apparatuses; combining future target indication systems with different on-board equipment (especially weapons control systems); extensive automation of target indication and weapons employment processes and increasing the capabilities of the latter. As a result, in the opinion of Western experts, the burden on the crews is substantially reduced and, most importantly, the effectiveness of future helicopters on the battlefield will increase. It is noted in this regard that the most active efforts in the field of creating combat helicopters for the long range future are being carried out in the U. S.

Combat helicopters of two types are in the inventories of NATO armies: specialized strike helicopters (previously called fire support helicopters) and multi-purpose helicopters, equipped with appropriate weapons and sighting devices. Helicopters of the former type at present exist on in the U. S. (AH-1S Huey Cobra and AH-64A Apache). In the West European countries the following multi-purpose machines are used as combat helicopters: AH-1 Lynx (Great Britain); BO-105P (FRG) and SA-342M (France). In the opinion of foreign military specialists, the main advantages of specialized combat helicopters over multi-purpose helicopters are their better speed and maneuver characteristics; enhanced combat survivability; ability to equip them with varied on-board reconnaissance and sighting equipment and armament; and more efficient deployment and employment. As a rule, the fuselages of these helicopters have a narrow cross section, which reduces the effective scatter area. They take into account the convenience of operations of their crew, which consists of two men situated in tandem (the weapons operator in the front seat and the pilot in the rear).

Development of specialized combat helicopters is presently under way jointly by the FRG and France (PAN-2 project) and has been completed in Italy (A-129 Mangusta).

The U. S. AH-1S Huey Cobra helicopter was created by the Bell firm as a result of the modernization of the first combat helicopter, the AH-1G, which entered U. S. Army Aviation in 1967 and was intended mainly for fire support of army forces. The AH-1S has been in inventory since 1977 and is at present the main U. S. Army combat helicopter. Overall, there are more than 1,000 machines of this type in U. S. Army Aviation, more than 300 of which were built from scratch and the remainder converted from the AH-1G.

The AH-1S is designed in a single propeller configuration with two-bladed lifting and tail rotors, a short, tapered wing and a ski landing gear. The blades of the lifting rotor are manufactured of composite material which improves survivability, reliability and repairability. It is noted that the wing relieves the lifting rotor at high flight speeds and improves the maneuverability of the helicopter. Under it are installed four pylons (two on each side) on which are hung Tow ATGMs [antitank guided missiles] (4 or 8 missiles only on external units) or caliber 70 mm Unguided Aerial Missile Launchers (with 7 and 19 launchers and a total of up to 76 rockets). Variants

of suspended armament are selected depending on the specific combat mission. In addition, a 3-tube 20 mm gun with 750 rounds is located in a turret below the helicopter fuselage.(2)

Guidance of the Tow ATGM to the target (maximum range 3,750 meters; armor penetrability of more than 500 mm) is implemented by the gunner alone with the use of a M-65 hydro-stabilized optical sight. The pilot ensures that the longitudinal axis of the helicopter matches the direction to the target. American specialists consider the one main shortcoming of the Tow ATGM to be the long firing cycle, caused mainly by the missile flight time to the target and the need to guide it until it hits. Firing of the unguided aerial missile which may be fitted with different warheads (high explosive-fragmentation, hollow-charge, smoke and illumination) to a distance of up to 4 km is conducted by the pilot alone. A fire control system has been set up on the helicopter to improve the effectiveness of weapons employment. It is based on a digital computer which inputs signals from the sensors of a Doppler navigation system, laser range finder and other sensors.

During the refitting and construction of new AH-1S Huey Cobra helicopters they underwent four stages of modernization, the main purpose of which was to improve their military capability. At present work is underway to rearm approximately half of these helicopters which are in U. S. Army Aviation with the Tow-2 ATGM (with greater armor penetrability) and equip them with a forward looking infrared system, which will be mounted on the same platform with the M-65 sight and make it possible to conduct combat operations at night.

The U. S. AH-65A Apache helicopter was developed by the Hughes firm and has been in the U. S. Army Aviation inventory since 1984. At first it was planned to purchase and deliver 515 of them to the U. S. Army by the end of 1988. However, at the end of 1984 the number was increased to 675.

At present efforts are underway to improve the AH-64A Apache helicopter further. These efforts are aimed at further increasing its effectiveness and expanding the tasks which it can perform. A new modification of the machine, (which will be designated the AH-64B) will have a more powerful power plant, a new lifting rotor made entirely of composite materials and improved flight path control and weapons control systems. It is also planned to make wide use of composite materials in the design of the helicopter air frame, which will reduce its weight and increase its payload. Work is also underway to improve the cabin configuration and to equip it with digital electronic instrumentation. A system being developed to reduce vibrations should decrease stress on the crew. It is planned to include air-to-air missiles to engage enemy air targets in the standard armament of the AH-64B.

According to the calculations of American specialists, completion of the efforts to modernize the Apache helicopter will also increase its operating range through the use of suspended fuel tanks. As special flight tests conducted in mid-1985 demonstrated, the operating range of the AH-64A Apache with four suspended fuel tanks is more than 1,500 km in a headwind. This will make it possible to fly independently from the continental U. S. to Europe along the so called North Atlantic Route (U. S. - Greenland - Iceland - Great

Britain - FRG). At present the task has be levied to increase the operating range of the AH-64B helicopter to 2,000 km or more which, in the opinion of American specialists, will enable it to fly independently if necessary from U. S. territory to Europe along the southern route through the Azores.

The British AH.1 Lynx helicopter (WG.13 Lynx) was also developed as a multi-purpose helicopter. It has been in the inventory since 1977. According to foreign press reports approximately 80 out of 114 helicopters of this type purchased are fitted to employ ATGMs, as well as other types of weapons, and constitute the main striking power of Great Britain's army aviation regiments.

The AH.1 Lynx helicopter can carry up to eight Tow ATGM, located in dual launchers in special brackets with four missiles on a side. The same M-65 sight is employed for their guidance as is found on the U. S. AH-1S Huey Cobra helicopter. Another eight missiles can be carried simultaneously in the helicopter cabin for subsequent rearming of the launchers under field conditions. As another variant the Hot ATGM can be used (maximum range 4,000 meters; armor penetrability more than 600 mm). Instead of missiles, the AH.1 Lynx can be equipped with unguided aerial missiles (36 each 68 or 70 mm) or suspended 7.62 mm machinegun launchers.

In connection with the increased attention to combat helicopters in recent years and the substantially greater requirements for them, the British Army command is seeking ways to qualitatively improve its fleet. The possibility of purchasing the Lynx-3 helicopter, which has been under development since 1982 by the British Westland firm on its own initiative, is viewed as one of these ways.

The Lynx-3 helicopter is essentially an improved modification of the Lynx AH.1 helicopter. Its flight testing began in mid-1984. According to the foreign press the Lynx-3 helicopter will be fitted with modern electronic equipment providing highly efficient weapons employment and the ability to operate at any time of day under simple and complex meteorological conditions. It is planned to use the Tow and Hot ATGMs and their new modifications, or the Hellfire, as well as third generation anti-tank missiles developed in the European countries. The American Hellfire missiles, with a semi-active laser guided warhead, is considered most preferable. This is the organic weapon on the AH-64A Apache helicopter. For combat against enemy helicopters and aircraft, it is planned to hang air-to-air guided missiles on the sides of the fuselage (two missiles on each side). This represents an aerial employment of the American Stinger anti-aircraft guided missile.

The West German BO-105P helicopter is the combat variant of the BO-105M light, multi-purpose helicopter. It has been in the FRG Army inventory since 1979 and is basically an anti-tank helicopter. The FRG has 212 of these helicopters, 168 of which are organizationally grouped in three anti-tank helicopter regiments (one per army corps).

The main organic weapon of this helicopter is the Hot ATGM (up to six missiles). A gyro-stabilized APX M397 optical sight mounted above the left pilot's cabin is used for guidance. As other variants of weapons on the helicopter it is planned to employ the Tow ATGM (up to eight missiles),

unguided aerial missiles of various calibers and small arms, which may be located both on the external suspension points and in the cabin.

According to foreign specialists the BO-105P has rather good flight characteristics, high maneuverability and relatively powerful weapons. However, because it is not able to operate at night and under difficult meteorological conditions, has low survivability and a number of other shortcomings, the Bundeswehr command viewed it as an interim measure (for the next 10-15 years), aimed at enhancing the capabilities of ground troops in combating tanks. Subsequently it was decided to replace the BO-105P with a specialized combat helicopter, which is now being developed jointly with France.

The French SA-342M Gazelle helicopter was developed by the (Aerospatiale) firm based on the light, multi-purpose SA-341 Gazelle helicopter of Anglo-French development. At present it is the main combat helicopter in the French Army (approximately 120 in inventory). The main attention during its development was paid to improving speed characteristics and increasing payload over the base model and to simplicity of operation and highly flexible combat employment.

The main organic weapons of the SA-342M helicopter are Hot ATGMs, located in two launchers (of two-three missiles each) in special brackets on the sides of the fuselage. The APX M397 sight is mounted above the cabin of the left pilot. The possible use of obsolete AS-11 or AS-12 ATGMs instead of the Hot missiles is also envisioned, as well as caliber 68 mm unguided aerial missiles or suspended 7.62 mm machinegun mounts.

A new Franco-West German combat helicopter is being developed using a single basic design configuration in three variants: the PAH-2 and HAC-3G anti-tank helicopters (for the FRG and France respectively) and the HAP helicopter (for France), intended primarily to combat helicopters and low flying aircraft and to destroy lightly armored targets and enemy personnel (see Figure).

In all variants the crew will include two men seated in tandem. The maximum take-off weight of the PAH-2 will be 4.7 tons, and of the HAP and the HAC-3G will be 3.5-4 tons. The power plant will include two shaft-turbine engines (maximum power of each of more than 1,000 horsepower). The blades and hubs of the lifting and tail rotors are to be made from composite materials, which will also be widely used in the design of the air frame.

The foreign press notes that the main armament of the PAH-2 helicopter will be eight Hot missiles, which, in the mid-1990s are to be replaced by third generation ATGMs of joint Anglo-French development, and four air-to-air guided missiles. It is also planned to install the new European ATGMs on the HAC-3G helicopter. The armament of the HAP helicopter will include air-to-air guided missiles, a 30 mm gun and a caliber 68 mm unguided aerial missile.

All helicopter variants are to be equipped with modern reconnaissance and sighting apparatuses, navigation equipment and weapons control systems, providing for their combat employment under good and bad meteorological conditions, day and night.

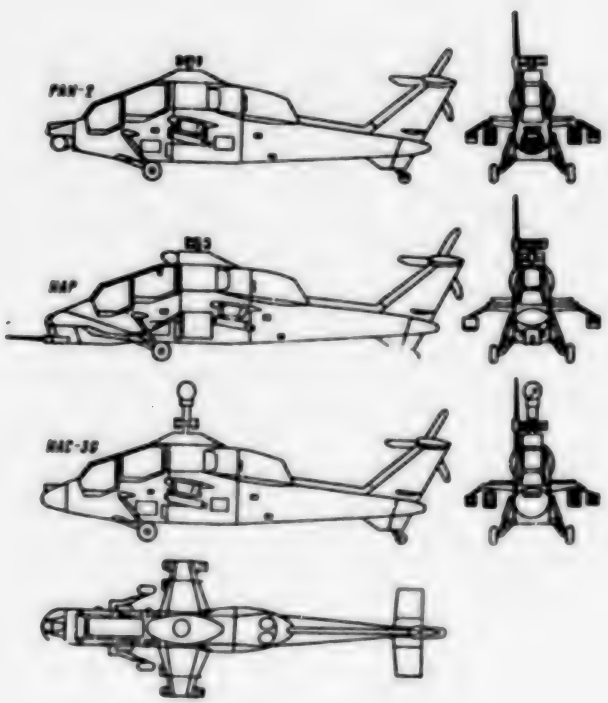


Figure 5. Variants of new Franco-West German helicopter

Flight testing of test models of the basic helicopter is to begin in 1987. The new helicopters should enter the inventory of the FRG and French armies during the early and mid-1990s.

The Italian A-129 Mangusta helicopter was developed by the Augusta firm primarily for the Italian Army. Deliveries of the initial 66 helicopters planned for purchase should begin in 1986. In designing this helicopter the developers were charged to create a sufficiently effective machine, with relatively high combat survivability, and at the same time relatively low cost, which, in the opinion of Italian specialists, had a decisive impact on the selection of weight and size specifications and on the ability to equip it with appropriate weapons and on-board equipment (primarily of American manufacture).

The foreign press notes that initially the main organic weapon on the A-129 helicopter will be American Tow ATGMs (eight missiles), and in the future possibly the Hellfire (six missiles). In addition, on all of the suspensions (there are a total of 4) launchers with 70 mm unguided aerial missiles or with caliber 12.7 mm machineguns can be hung. Mixed armament variants are also envisioned.

A sighting system (located in the nose section of the fuselage) is used for weapons guidance. It includes a gyro-stabilized optical sight, a forward view infrared station and laser range finder, as well as a comprehensive element sighting system. Weapons guidance is achieved through the IMS integrated multiplex system manufactured by the American Harris firm, which is based on two computers and coordinates all the electronic equipment systems.

The power plant consists of 2 shaft-turbine engines of 895 horsepower each. Its cruising speed is 250 km per hour.

The future American SCAT (Scout Attack) reconnaissance-strike helicopter is in the stage of conceptual development in the LHX (Light Helicopter Experimental) program. It is planned that this will replace the AH-1S Huey Cobra helicopter in the mid-1990s.

At the present stage, the efforts to develop individual elements of this helicopter and its on-board test systems being carried out in the ARTI (Advanced Rotorcraft Technology Integration) program are aimed in particular at determining the required level of automation, taking into account the permissible work load on the pilot; developing technical requirements for cabin configuration with a high degree of integration of on-board systems; assessing the assigned reliability indices and developing the helicopter's speed and maneuver requirements.

According to foreign press reports, analysis of helicopter employment with an assessment of 48 flight profiles has already been completed; functional requirements for its subsystems have been defined; areas of critical work load have been disclosed; requirements for information portrayal and control systems have been developed (as well as for the degree of automation of the pilot's cabin) and preliminary design of on-board systems has begun. At the same time, the results of research being carried out in the U. S. and in other

programs are being extensively used. This research is associated, in particular, with efforts in the field of design of air frames and lifting rotors, including those made of composite materials; high-efficiency engines and future transmissions; flight control systems (including digital fiber-optic) and on-board equipment and weapons.

The main difficulty in selecting armament for the SCAT helicopter, in the opinion of American specialists, is in creating a multi-purpose weapons system to combat ground (most importantly tank) and aerial targets. Primary attention is being paid to automation of target designation and weapons guidance equipment. It is planned that the helicopters will be fitted with an automatic gun and more modern missiles, including air-to-air missiles.

The foreign press reports that the take-off weight of the SCAT helicopter will be approximately 3.5 tons, it will have a 1200 horsepower engine and flight speed will be more than 300 km per hour. Flight testing of experimental models is to be conducted no sooner than 1989.

FOOTNOTE

1. In the foreign press combat helicopters are often called antitank helicopters.

9069
CSO: 1801/4

FIGHTER-BOMBERS IN COMBAT

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 29-35

[Article by Col V. Kirillov, candidate of military sciences: "Fighter-Bombers in Combat"]

[Text] In the first part of this article* the views of foreign military specialists were examined on such primary factors determining the military capabilities of fighter-bombers as self-sufficiency and survivability. Below, based on information published in the Western press, are discussed their views on two other factors: multiple functions and destructive power (firepower).

Multiple functions are the ability of an aircraft to accomplish several different types of missions. The name "fighter-bomber" itself contains an assertion that the aircraft is able to engage in aerial combat and make strikes against ground targets. For this it must possess sufficiently high maneuverability and be equipped with air to air and air to surface weapons. In local wars unleashed by imperialism fighter-bombers have also been intensively used as ground attack aircraft, thereby accomplishing a third mission.

In assessing the results of the combat employment of such aircraft, foreign military specialists expressed their attitude toward the concept of their multi-functionality as follows.

First, it was acknowledged that the use of fighter-bombers as ground attack aircraft was forced and not always successful. Ground attack aircraft, which were withdrawn from the inventory of the air forces in almost all the Western countries in the 1950s, had a number of favorable qualities inherent only to them, which they manifested in fulfilling a specific, major and difficult combat mission -- direct air support to ground forces. Experience showed that fighter-bombers were too heavy and sluggish and could not be based at front-line airfields. Therefore, their reaction time to calls for support did not meet the norms. Pilots frequently carried as "dead weight" the sighting and navigation equipment designed to to be used on long trips and under any

*See ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1986, No 6, pp 31-37. (Ed.)

weather conditions. And most importantly, the costly and complex multi-purpose aircraft turned out to be just as vulnerable to antiaircraft fire over the battlefield as a simple and inexpensive ground attack aircraft. For these reasons, the F-105 and F-4 fighter-bombers were removed by the American command from direct support missions in Vietnam, although the interventionist troops greatly needed continuous air support.

Second, the fighter-bomber, based on its initial purpose, was to replace fighters in aerial battles. However, such replacement also did not always turn out to be successful. Foreign experts believe that the reason for this is also the fact that the aircraft specifications did not correspond to the conditions of their assigned mission. In a combat environment the main factors which determine the ability of a modern fighter to wage aerial combat became clear. Among the main factors are thrust-to-weight ratio and maneuverability (depending, in particular, on the specific load on the wings). Thus, the multi-purpose American F-4 Phantom aircraft was inferior to the light, Vietnamese fighter. With equal thrust-to-weight ratios, according to the Western press, it had more than 100 kg per square meter wing load. The heaviness of the aircraft; i.e., its sluggishness during evasive maneuver and breaking contact from the enemy, directly affected its index of survivability. As a result, under conditions of overwhelming numerical superiority in the air, the Phantoms suffered heavy combat losses.

AIR FORCE JOURNAL wrote that during the design stage much was said in favor of the multi-purpose aircraft, but in the complex real combat environment all of these arguments were destroyed. The journal thus explains why it was unwise to assign the fighter yet another function, that of delivery of air to surface weapons to ground targets.

So that the aircraft could withstand all of the heavy external stores at 4-5 units of g, it was necessary to reinforce the structure of its wing and fuselage. The wing-load increased, which had a negative effect in aerial combat. In addition, the multi-purpose aircraft is unavoidably more complex, and this led not only to a greater number of system malfunctions; i.e., to protracted idle times for inoperable equipment, but also to an increase in the required number of maintenance personnel. The defensive weaknesses of the Phantom were immediately revealed in the bomber variant. As the journal noted, in the event he was attacked the pilot had to throw off his air to surface weapons, and he then had only two air to air missiles to conduct the air battles. Therefore, the aircraft were always readied on the ground in two separate variants -- fighters and bombers -- and their interchangeability in the air was removed.

However, man remained the main obstacle. As Western experts acknowledge, they have not succeeded in making a "multi-function" pilot. The wide variety of types of weapons, complex tactics for breaking through air defenses and imperfect search, guidance and identification systems made strikes against ground targets just as difficult and major a task as was aerial combat. AIR FORCE JOURNAL wrote on this subject that if one compared the Korean War, where specially trained crews waged aerial combat, with the war in Vietnam, where "jacks of all trades" flew, in the latter case the level of losses doubled,

and costs expressed in aircraft shot down greatly exceeded the savings hoped for through their multi-purpose nature.

Considering the lessons of the wars in Southeast Asia and the October 1973 Middle East War, the multi-function F-4 Phantom-2 fighters were virtually removed from fighter functions. Thus, during the war in Lebanon in 1982 the Israeli aggressors used the F-4 aircraft only as a tactical bomber, and F-15 and F-16 fighters waged aerial combat.

However, evaluating the nature of these aerial battles, despite the fact that the F-15 fighters, equipped with medium range, all-aspect angle weapons, took part in them, Western military experts note that in the majority of cases they were group and maneuver battles and were waged at short ranges with the use of missiles with infrared homing warheads. From their point of view committing an aircraft costing $20 million to such combat was not entirely justified. In order to recover the cost and expand the capability to maneuver forces in terms of the missions being accomplished, the U. S. decided to return to the previously rejected concept of multi-function aircraft; i.e., in this case to "load" the fighter with one more function -- that of a strike aircraft. For this purpose, previously manufactured fighters were repeatedly modified, improved sighting and navigation devices were mounted on them and fighter personnel underwent additional training on the combat employment of the weapons on their aircraft in striking various ground targets. In addition, the U. S. Air Force command is planning to purchase almost 400 F-15E, so called, dual-purpose aircraft in the next few years.

The dual-purpose F-15E, compared to previous models, immediately became heavier. Its maximum takeoff weight increased to 36 tons. However, at a weight of 30 tons its g-load factor (at a speed of 925 km per hour) was reduced to 9; i.e., its maneuver characteristics declined.

To carry out day and night operations against ground targets under difficult meteorological conditions a modernized APG-63 radar, the LANTIRN system container apparatus and other sighting-navigation and flying equipment designed for automated target search and seizure, and integrated, automated aircraft and weapons guidance were installed in the aircraft.

Foreign military specialists believe that implementation of dual-purpose is possible only if the crew, which bears heavy psychological burdens, is appropriately trained. Therefore, the F-15E aircraft became a 2-seater. A weapons control operator was added to assist the pilot.

It was noted in the foreign press that with the F-15E aircraft the U. S. Air Force can more effectively redistribute its forces during combat operations, striking from ground targets to air targets and vice versa. However, the result of tests of an experimental aircraft under near-combat conditions introduced significant adjustments in the concept of identical capabilities which they had proclaimed. Recently American experts have begun to refer to the F-15E aircraft as a fighter-bomber, acknowledging the priority of strike missions. Thus, according to information in AVIATION WEEK AND SPACE TECHNOLOGY, U. S. Air Force plans for using units and subunits equipped with F-15E fighters allocate 70 percent of the resources for accomplishing missions

of isolating the area of combat operations, and only 30 percent for gaining air superiority.

As the foreign press indicates, a tendency has been noted in several European NATO countries to reequip their air forces with lighter, multi-purpose tactical fighters. In particular, Norway, Denmark, The Netherlands and Belgium are completing a program of reequipping their air forces with the F-16 light combat aircraft, which in terms of their specifications can operate on virtually the same level as aerial fighters and strike aircraft. In this case, the purpose and capability of units and subunits are determined by the presence of weapons and by the nature and level of pilot training to accomplish varied missions.

However, such states as the FRG, Great Britain and Italy have taken a somewhat different approach. They are reequipping some of their military aviation with new Tornado tactical fighters in the strike variant, using as air defense fighters other aircraft better suited for this purpose. At the same time, when the British air forces required a fighter-interceptor, British specialists reckoned that the Tornado has many flying and tactical characteristics inherent to an interceptor. After equipping the aircraft with appropriate sighting and navigation equipment and weapons, which entailed only insignificant changes in the design of the fuselage, it was placed in the British Air Force inventory, to distinguish it from the Tornado-GR.1 strike variant it was called the Tornado-F.2.

Thus, multi-functions, with respect to the European Tornado aircraft, means using its individual modifications for accomplishing different combat missions.

In principle, according to foreign specialists, any modern tactical combat aircraft, in addition to its primary purpose, to one degree or another possesses a multi-function capability. In particular, a fighter-bomber can be used when necessary as a strike aircraft (bomber, ground attack aircraft), aerial combat fighter, interceptor, escort fighter, and tactical aerial reconnaissance aircraft. Its capabilities, besides flying and tactical characteristics, are determined by the ability to carry different weapons and equipment, and crew training.

Thus, in the British Air Force some Jaguar fighter bombers were assigned another primary mission -- aerial reconnaissance. For this purpose they are equipped with special suspended containers with various reconnaissance apparatuses, supplemental fuel tanks and other necessary equipment. During military training their crews regularly are trained to accomplish reconnaissance missions.

Destructive power (firepower) is the factor which in the final analysis determines the combat effectiveness of an aircraft. Examining operations of fighter-bombers against ground targets, foreign military specialists emphasize such features as the variety of targets intended for destruction: according to size -- point and area; according to possibility of detection -- contrast and non-contrast; according to mobility -- stationary and mobile; according to location relative to the front line -- on the battlefield and in the tactical

and operational depth; according to degree of protection by air defense weapons — strong, weak, etc. Therefore, the most varied weapons systems are required for their destruction: aerial bombs, incendiary tanks, cluster munitions, guided and free rockets, aerial guns. But it is not enough to have all of these munitions, it is necessary to be able to vary them, depending on the nature of the mission and conditions under which it is accomplished.

According to the views of Western experts, the main mission of fighter-bomber aviation is to isolate the area of combat operations, and the main method of accomplishing it is to make strikes against enemy troops in concentration areas and on the march, and against air fields, bridges and other lines of communication targets, control posts, depots, fortified lines (areas) and other important targets.

Studying the experience of local wars, Western experts paid particular attention to the extremely large number of forces directed at accomplishing this mission. In particular, the American aggressors had to make up to 360 sorties per day, not counting forces operating against other targets, only to prevent or reduce the intensiveness of the movement of Vietnamese troops, by destroying crossing sites and bridges covered by antiaircraft artillery.

U. S. specialists believed that low bombing accuracy was the main reason for this situation. For example, when bombing from the F-105 fighter-bomber (under the most favorable attack regimen) the circular probable error [CEP] of aerial bombs was 90 meters. Thus, the problem of destructive power was closely linked with the problem of the accuracy of weapons' employment.

Therefore, at the end of the Vietnam War, as well as in later armed conflicts in the Middle East and the Falklands (Malvinas), U. S., Israeli and British military aircraft already employed high-precision air to surface guided weapons with various guidance systems. According to the foreign press, their CEP was 6-16 meters. Therefore, the number of aircraft assigned to destroy one typical target declined 4 or 5-fold. However, the cost of the weapons substantially increased. Moreover, from the experience of these wars Western specialists noted one additional feature. Far from all targets assigned for destruction by fighter-bombers required the use of guided weapons (for example, area targets). Although the percentage of sorties using guided weapons gradually increased in local wars, as the foreign press notes, it did not even exceed one-fifth of the overall number of sorties.

Studying the experience of combat operations by aviation in local wars, foreign specialists came to the conclusion that the methods of making strikes using conventional means (aerial bombs, unguided aerial missiles, guns) had long been developed and the main ways of improving their effectiveness were through improving the search and sighting systems and the level of pilot training. Therefore, along with developing new models of weapons and sighting systems, the NATO countries are paying a great deal of attention to training crews for the military employment of the onboard weapons of their aircraft under various conditions. This is being done not only during the process of improving their flight training, but also during the basic training course and even when retraining on new type aircraft.

In particular, when retraining British pilots on the Tornado aircraft, the whole program is divided into two courses: mastering flying in the aircraft (training on takeoff and landing, working out techniques for piloting in a zone, etc.) (30 flight hours total); and combat employment (31 flight hours). During the second part of the program the following exercises are accomplished: bombing from horizontal flights at low altitude (3-4 flights); bombing with pitch-up using radars and other search and sighting systems (3-4 flights); working out these same attack methods, but when approaching the target following terrain contour (flight altitude at manual control -- 300 meters; at automatic control -- 200 meters) with gradual transition to night flights and to attacks from the first target run. During training flights in line units the flight altitude for terrain hugging flights is reduced to 100-75 meters.

Studying military experience of NATO aviation, Western military experts have come to the conclusion that low and maximally low altitude flights, with subsequent target attack from the first target run, remains the primary deep penetration tactical technique of modern fighter-bombers.

On the whole, in their opinion, all the above mentioned four factors -- self-sufficiency, survivability, multiple functions and destructive power -- are interrelated, depend on one another and are distinctly manifested during every fighter-bomber combat flight.

In particular, the struggle for survivability begins at the moment the aircraft enters the enemy's radar field or, more accurately, even prior to this, when the crew uses the following tactical and technical capabilities in order to cross the line of detection toward the enemy: low altitude flight; flying a route along "blind" sectors of the enemy radar, formed by terrain elevations; organization of demonstration group actions; following radio silence; and use of combat security means -- establishing masking interference through electronic warfare aircraft, etc.

After this the aircraft must pass through the zone of fire of antiaircraft artillery and the ZRK [air defense missile system] of troop air defense. Based on modelling results and experience from Red Flag type aviation exercises, some American specialists believe that a high speed dash at low altitude, which ensures the aircraft will be in the zone of intensive ground fire for the shortest period of time, is the most advisable tactical option. However, in the opinion of other experts, the concept of low altitude flight to the target, based on excluding early detection of the aircraft, may turn out to be unsound after more modern detection systems are introduced. Therefore, as a variant, although it is still contentious, they model a "dash" to the target at supersonic speed at great altitude; i.e., above the boundary of the zone of destruction of troop air defense weapons.

The next stage of the flight takes place in the zone of action of medium range air defense missile systems. The threat of attacks from enemy fighter-interceptors also increases. The factor of self-sufficiency begins to come into full force. According to the views of foreign specialists, of late escorting strike groups with fighters is becoming ever less promising, since escorts suffer heavy losses even with equal numbers of defending forces, and

these losses become unacceptable under conditions of quantitative superiority of enemy fighter-interceptors. Therefore, already during the aggressive war against Lebanon in 1982 Israeli aviation rejected direct accompaniment of strike aircraft in favor of a mobile screen and groups for clearing the air space in the area of the strikes.

The independent flight of fighter-bombers in this stage necessitates organizing "local" defense of the combat formation, in the interests of which means of individual protection are employed, anti-missile and anti-fighter maneuvers are carried out and defensive aerial combat is conducted without aborting the subsequent movement to the strike target. The joint use of aircraft of several modifications, within the framework of a single mission, for example, F-15C and F-15E (the former in a fighter variant, and the latter a strike variant) are possible.

At the final stage of the flight, the area where the strike targets are located, covered by air defense weapons, the factor of "destructive power" is added to the three factors mentioned. Therefore, this stage is considered the most difficult and saturated and requires high professionalism from the crew and a successful combination of maneuver and fire capabilities, as well as reliable functioning of the search and sighting systems, from the aircraft. The foreign military press emphasizes that fighter-bombers suffered the greatest number of losses in local wars during this flight stage.

Based on everything stated above, the U. S. Air Force Command and U. S. allies in the aggressive NATO bloc, in the process of preparing to unleash war against the USSR and the other countries of the Socialist community, along with improving existing and developing new systems of weapons and aviation equipment, are paying a great deal of attention to improving the level of crew combat training. This is indicated by the rigid norms and requirements assigned to flight personnel during all manner of exercises and maneuvers.

In particular, for fighter-bomber crews during the annual competitive exercises of the NATO combined air forces, the following norms have been established: height of flight along a route (duration from 1 hour to 1 hour 20 minutes) 75 meters; flight speed 780-925 km per hour (the first value supposedly corresponds to the least in-flight crew fatigue); permissible accuracy in reaching the target in time of plus or minus 5 seconds (targets for bombing and firing on the range are columns and concentrations of tank mockups, as well as aircraft on open aircraft parks and in shelters), and aircraft located over the target area more than 20 seconds are considered "shot down" (i.e., maneuver and target attack must be kept within this time).

"Enemy" air defense and electronic warfare weapons oppose the crews as they fly the route. The time and correctness of crew reaction to illumination of the aircraft by "enemy" radars of various types and the use of all possible protective measures are also taken into account. As a rule, "enemy" fighters patrol in a zone located on the approaches to the strike targets (information about them is not reported to the competing fighter-bomber crews). Every aircraft which an "enemy" fighter has tracked continuously (in the lock-on position) for 5 seconds to a range of 1,800 meters is considered "shot down." Characteristically, the arrival time at the target is set in advance, and the

crews themselves calculate the takeoff time, taking into account possible changes in the flight path and maneuvers, to evade or repulse fighter attacks. At the same time, in case of need pilots during the flight must be able to select other tactical techniques in response to sudden changes in the situation. Thus, not only are professional training and skills tested, but also the level of tactical thinking of flight personnel.

9069
CSO: 1801/4

AIR-TO-AIR WEAPONS FOR HELICOPTERS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 35-37

[Article by Col V. Dmitriyev: "Air-to-Air Weapons for Helicopters"]

[Text] One of the tendencies in the development of the armed forces of the countries in the aggressive NATO Bloc, judging by one press report, is continuously improving the combat capabilities of army aviation, mainly by increasing the numbers and modernizing the helicopter fleet. For example, the Pentagon intends to nearly double the fighting strength of modern combat and reconnaissance helicopters by the mid-1990s. In connection with this tendency, Western military specialists believe that clashes between opposing helicopters will become unavoidable in future military conflicts. This necessitates developing both tactics for waging aerial combat between helicopters, as well as appropriate weapons and onboard equipment enabling the helicopter to strike aerial targets.

In the opinion of foreign military experts, aerial combat by helicopters is an entirely new type of combat operation, since at present it is now recommended that evasive tactics be taken when they are encountered. At the same time, it is believed that helicopters are characterized by the same main attributes for close aerial combat as are fixed-wing aircraft and have identical requirements for its conduct, including: operating by surprise; target identification and intercept at maximum possible range; run-in for the attack from the aft hemisphere; high maneuverability and quick reactions; retention of dynamism of motion and the ability at any moment to gain the required altitude; high acceleration characteristics; and, the ability to observe the surrounding environment.

Analyzing the tactical and technical specifications of such modern helicopters as the UH-60 Blackhawk and AH-64 Apache (U. S.); BO-105 (FRG) and BK-117 (FRG-Japan) foreign military specialists note their high maneuverability, although for the majority of helicopters in inventory, including the American UH-1 Iroquois and the AH-1 Huey Cobra, serious limitations exist, for example a speed of roll-in to a turn no greater than 40 degrees per second and the impermissibility of negative load factors in flight. In addition, all helicopters are characterized by such shortcomings as the inability to fly with a g-load greater than 3.5; a significant increase in drag when completing

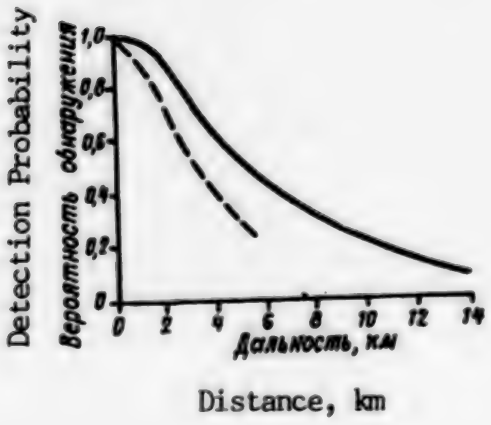


Figure 1. Plot of dependency of probability of mutual detection of helicopters on distance

a turn and becoming a virtually immobile target when shifting to hover mode. Moreover, in view of the very small turn radius the helicopter is not able to leave the fire sector rapidly when it is pursued, in contrast to a fixed wing aircraft, which in this case makes a sharp turn.

It is also believed that the organization and conduct of air to air combat between helicopters has a number of other special features. First, climatic and geographic conditions in the European theatre of war substantially limit the probability of detection of one helicopter by another. Figure 1 presents two curves depicting the dependency on range of the probability of mutual detection of helicopters flying at an altitude of 15 meters with a relative speed of 55 km per hour, for typical Western European conditions. The upper curve is for so-called instantaneous detection and the lower for detection within 5 seconds. Second, a low-flying helicopter may be a target for small arms and mobile ZRK [air defense missile systems] of ground forces subunits. Finally, in air to air combat between helicopters, the helicopter being pursued may attempt to lead the attacking enemy helicopter into the zone of fire of its PVO [air defense] or the area of operations of its tactical aviation.

Taking into account the possibility that air to air combat between helicopters may arise in the future, the NATO countries have in recent years been conducting tests, evaluations and research, both to develop tactics for helicopter aerial combat, and to create corresponding helicopter armament. The U. S. does not intend to develop a special helicopter for air to air combat, but plans to solve this problem by taking into account the special features of aerial combat tactics in the design and equipping of present and future helicopters, as well as by mounting on them weapons for aerial combat. France and the FRG are jointly developing an HAP (Helicoptere d'Appui et de Protection) one of the main tasks of which will be to combat enemy helicopters.

In 1984 the U. S. tested helicopters of various types and designations, during the course of which they carried out many types of maneuvers characteristic of air-to-air combat by fixed wing aircraft, including horizontal scissors; half-roll maneuvers; climbing or diving with subsequent turn; side-slipping; rapid deceleration; acceleration and deceleration at a constant altitude; recovery from a dive with X-rotation; turns; exit from a climb to horizontal flight; backward flight and accelerated turn with climb. It is reported that the results of the testing made it possible to evaluate the maneuverability and speed capabilities of contemporary helicopters, as well as to define certain requirements for specifications which will be taken into account in developing new helicopters, for example in the LHX program.

A gun and short range air-to-air guided missiles (UR) are being examined as air-to-air combat weapons for helicopters. Western military specialists believe that the combat employment of a gun represents a more complex problem than that of a guided missile. This is for the following reasons. To achieve a firing accuracy of several milliradians (striking a target approximately 10 meters in size at a distance of 1,000 meters) from a turret-mounted gun with a wide sector of fire in the horizontal and vertical planes, it is necessary to accomplish a number of adjustments, in particular according to the speed of

the target and the change in the distance to the target during the time of flight of the rounds; calculations of ballistic correction factors; adjustment for actual wind parameters; compensation for the shift in the center of gravity and orientation of the helicopter during firing, etc. In addition, compared with fixed wing aircraft, helicopters have a less rigid fuselage construction and, therefore, its deformation introduces a continuously changing error in the attitude of the gun sight line. Two methods are proposed to eliminate this error. The first is to introduce a rigid mechanical link between the gun and sighting device, which is considered in principle to be a simple solution, but not entirely acceptable in practice. Therefore, the second method is assessed as more promising. This provides for mathematical modelling of the deformations in the helicopter fuselage and inputting them into the fire control computer, which makes calculations to adjust the attitude of the gun sight line.

Taking into account the above considerations, as well as the ability to obtain greater destructive ranges compared to a gun and to exploit all the advantages of self-guidance, military specialists in several foreign countries, for example the U. S., FRG and France, give preference to guided missiles as the helicopter weapon for air-to-air combat. In the U. S., efforts to create an air-to-air combat weapon for helicopters are moving in two main directions. The first envisions using the existing AIM-9L Sidewinder guided missile with an infrared homing warhead now in the inventory for virtually all tactical aircraft in the NATO countries and in several other Capitalist states to equip fire support helicopters such as the AH-1T. The second direction is being implemented within the framework of the 2 year program carried out since early 1985 to develop the MIMS (Multi-Purpose Lightweight Missile System) helicopter missile system, based on the Stinger air defense missile.

It is envisioned that the guided missile in the MIMS system will have a maximum destruction range of 4 km. This missile, which is designed in a canard configuration, with aerodynamic surfaces which extend after launch, has a length of approximately 1.5 meters, a body diameter of 70 mm and launch weight of 10 kg. It is equipped with an IK GSN [infrared homing warhead] which is guided by the method of proportional navigation at any target aspect angle. A photoresistor, cooled by liquid nitrogen from a cylinder located in the launcher (PU) is used as the sensor element in the GSN. A two spectrum GSN is also being developed for this missile, which is interchangeable with the IK GSN and is sensitive in the infrared and ultraviolet wave sub-bands, which improves the anti-jamming capability of the warhead against infrared traps and improves target discrimination against a background of interference. The missile has a high explosive-fragmentation warhead. It uses as its power plant a 2-mode solid fuel rocket engine, which operates for approximately 6 seconds and enables the missile to develop a flight speed of 700 meters per second.

It is intended that the missile will be launched from either a closed or open type launcher, which has two missiles in transport-launch containers, to simplify and speed up the loading process. The weight of the closed type launcher is 63 kg as mounted. Within the launcher are electronics which facilitate the launch and a cylinder with liquid nitrogen, which permits 40 cycles of cooling of the GSN sensor (maximum duration of each of 40 seconds).

When two pairs of launchers are hung on each side of the helicopter fuselage its maximum load is 8 missiles. As first priority it is planned to arm with the MIMS system the American OH-58 Kiawa, AH-1S Huey Cobra and Hughes 500 helicopters, and in the future the AH-64 Apache and the LHX, as well as the West German PAH-2 helicopter.

In France, the AATCP (Air-Air Tres Courte Portee) air-to-air helicopter guided missile is one of the variants of the Mistral air defense missile, which is under development. According to design specifications, the range of fire of this missile is to be 4-6 km; launch weight -- 17 kg; flight speed -- up to Mach 2.6; length -- 1.8 meters and body diameter -- 90 mm. It is built in a canard configuration, with tail control surfaces which extend following launch and have electromotor servos. It is believed that the multi-segment IK GSN will guide the missile under any target aspect angle. Cooling of these GSN sensor elements is accomplished by a cooling agent emitted from a cylinder located in the launcher. The missile is equipped with a fragmentation warhead, with fragments in the form of tungsten balls, which will be exploded by an active laser fuse. A 2-state solid fuel engine serves as the propulsion system, and a thermochemical battery serves as the power source. It is planned that the missiles will be launched from paired, open-type launchers. French army aviation helicopters, in particular the SA-342 Gazelle and the HAP will be equipped with such launchers.

Judging by foreign press reports, efforts to equip combat helicopters with missiles for air to air combat are also underway in other Capitalist countries. Thus, in Great Britain a project has been under study for equipping Gazelle helicopters with Blowpipe air defense missiles with a radio command guidance system, and the Lynx with the Swedish RBS70 ZUR [air defense guided missile]. The Franco-West German consortium, Euromissile, has been developing on its own initiative the Fakir-H missile (an alternative variant of the AATCP missile) with IK GSN and a design range of fire of 6 km, which were to be placed in the helicopter launchers for the Hot antitank missiles. The above described research and development indicates that in recent years NATO has begun to pay more attention to expanding the capabilities and increasing the combat effectiveness of helicopters, by developing specialized air-to-air combat weapons for them, which it is expected will be placed in inventory in the late 1980s.

9069
CSO: 1801/4

IMPROVING U. S. NAVY SURVEILLANCE SYSTEMS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 43-47

[Article by Capt 1st Rank (Res) A. Markov: "Improving U. S. Navy Surveillance Systems"]

[Text] The U. S. Navy command, envisioning extensive use of the world's oceans to implement its aggressive plans, considers one of its most important missions to be establishment of control of the ocean expanses and attainment of reliable information about the enemy, as well as reporting it in a timely manner to various consumers. In this regard, it pays the closest attention to the development of surveillance systems, which encompass all of the world's oceans. Due to modern scientific and technological achievements, in the opinion of American military specialists, the capabilities of existing surveillance systems are substantially expanding, which permits near real-time solutions to problems of detecting and classifying surface, subsurface and air targets, as well as determining first-priority strike targets and providing target acquisition of them.

The qualitative changes which have taken place in the Navy in recent years (missions accomplished by operational formations have become more complicated; their zones of responsibility have expanded; the organization for conducting combat operations has changed qualitatively, associated with the placing in inventory of new models of weapons and military equipment; the amount of information needed by commanders at various levels has sharply increased) have led to the need to create a fundamentally new system of surveillance at sea. The main requirements for this system were completely formulated in the late 1970s. They amount to providing the command with reliable information about the locations of surface, subsurface and aerial targets of interest to it, with appropriate accuracy and in real time.

Evaluation of the requirements of surveillance and analysis of the operation of existing systems was accomplished by the electronic systems command (Navelex). As the foreign press emphasized, specialists in this command concluded that the most promising information system, in terms of global coverage and all-round analysis of information, will be the integrated surveillance system ITSS (integrated tactical surveillance system). In the future it is to develop into the Navy information system and represent a

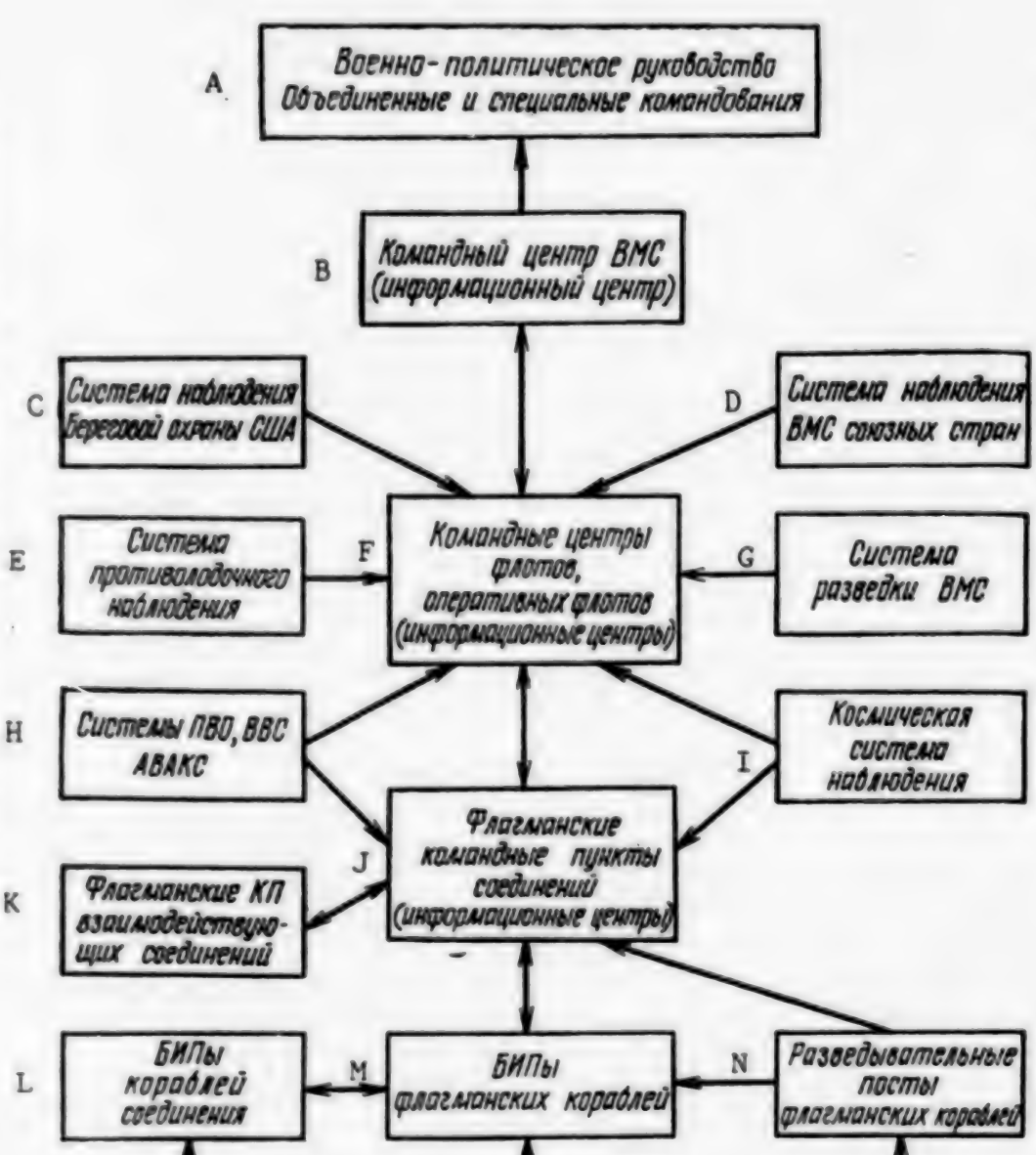
complex of surveillance, command, control and communications systems, integrated and linked technologically and mathematically. Through its resources it is to provide detection of all objects at sea at any time of day or night and under any weather conditions; determine their location and elements of movement; classify and determine the nationality of ships and aircraft, and provide the command with reliable information about the situation.

The foreign press notes that ITSS will be developed and created based on existing surveillance systems. They must not cease operation during this time and the effectiveness of their output is to be gradually increased. It is planned that newly developed equipment will be introduced as it is developed, and already existing equipment which does not meet requirements will be improved.

American specialists state that the U. S. Navy integrated surveillance system will encompass the maximum number of sources of information and make it possible for any element of the system to use information found in the data bank. It is structured according to a regional principle. Information about its region of responsibility will be concentrated in each information system. The system will consist of shore and ship-based elements. Its overall composition and structure are shown in the diagram.

The central organ of the system's ship-based element will be information centers of flagship command posts of forces and large commands located in various regions of the world's oceans. Information centers are equipped with means of collecting, processing and disseminating information throughout the operating area of the force (large command). One of these means is the automated system, Outlaw Shark, developed by the Lockheed firm, for providing over the horizon target acquisition to anti-ship missiles having great (over the horizon) range (Harpoon, Tomahawk). The Outlaw Shark system, based on information from satellite surveillance, as well as reports from other sources, including ship-board and shore elements, works out initial firing data. The technological resources and mathematical support for this system, in the opinion of American military specialists, turned out to be highly successful, despite the narrowness of the mission being accomplished. They made the majority of the requirements levied upon the flagship command post processing and display systems: high effectiveness, based on processing information using minicomputers; depiction of reports on visual displays; correspondence of mathematical support to the tasks of correlation and display of information. At the end of 1983 several sets of the completed apparatuses were shipped to the Navy for operational testing in flagship command posts. To collect and transmit information the computer complex of the information centers, using a special digital communications net at the flagship command post, was linked with all ship-board and external sources and consumers of information.

The main ship-board information sources are the combat information post and the reconnaissance post on the flagship. These posts analyze and evaluate all information received, classify targets by nationality and then transmit information to the flagship command post information centers.



A - Military and political leadership
Combined and special commands
B - Naval command center (information center)
C - U. S. coastal defense observation system
D - Observation system of allied navies
E - anti-submarine observation system
F - Command centers of fleets and operational fleets (information centers)
G - Naval reconnaissance system
H - AD, air force and AWACS systems
I - Space observation system
J - Force flagship command posts (information centers)
K - Flagship command posts of coordinating forces
L - CICs of force ships
M - Flagship CICs
N - Flagship reconnaissance posts
O - Technical and visual means of observation of force ships and aircraft
P - Force tactical reconnaissance means

Structure of U. S. Navy Integrated Observation System

The combat information post (CIC -- combat information center) is to collect, process and depict information required by the ship commander in a combat (in-transit) situation. Information is concentrated in the post groups about the surface, subsurface, air and electronic environment within the area of operations of the ship's technical resources, and similar information is collected within the zone of responsibility of the force, with the aid of the NTDS (Navy Tactical Data System) automated system for collecting, processing and disseminating data. Technical surveillance data are automatically sent to the NTDS computer, where they are processed and transmitted to other ships in the force. Results of visual surveillance and information obtained through other channels are input manually into the computer. Air Force and Naval Aviation aircraft and helicopters equipped with the NTDS and the ATDS (Air Tactical Data System) provide their information on observed targets directly to the combat information centers of the ships.

Despite the rather high tactical indices of the NTDS system, the American command, judging by foreign press reports, is continuing efforts to further improve its effectiveness. Thus, in the next 15 years it is planned to shift it to the higher speed and higher carrying capacity DZhTIDS [Joint Tactical Information Distribution System] and data transmission and dissemination system, developed for use by all U. S. Armed Services.

Intelligence centers (IC) are located on all flagships and are intended to provide the force command with information about the enemy. Communications and electronics intelligence groups on the ships of the force are the main sources of information for the center. Communications between the center and the groups is implemented on a special intelligence information collection net. Additionally, the intelligence center periodically receives information about the enemy in the operating area of the force from shore-based intelligence centers. From the overall amount of intelligence information obtained and processed, the intelligence centers select current information about the location of enemy forces, which is then transmitted to the information centers of flagship command posts and the ship combat information center.

Centers for receiving SSES (Ship Signal Exploitation Space) signals, to exploit data from communications and electronic intelligence, including from satellite surveillance systems, are deployed on major U. S. ships. The data obtained are transmitted to the Outlaw Shark target acquisition system, and also to the combat information centers and the intelligence centers. The latter, after analyzing and fixing the target, transmit reliable information to the flagship command post information centers. They also receive signals from other space systems operating in the interests of the Navy (navigational, communications, meteorological).

The shore-based IISS element consists of several major information centers, which facilitate information collection and dissemination over a wide area (globally) or throughout the main theaters. These information centers will be developed from expanded and modernized data processing centers of the OSIS (Ocean Surveillance Information System). This system was developed in the second half of the 1970s and provides current information to Navy fleet command centers. At present it provides centralized information collection

and correlation on the situation in areas of the world's oceans. Specialized elements, equipped with means of automated data processing, analyze, correlate and transmit reports on the current situation twice per day to the commands of the main operational formations. However, this no longer satisfies fully the needs of the Navy command. Therefore, back in December 1982 a decision was made to modernize the information processing resources and automate the information collection and dissemination process. Modernization of the OSIS centers as the main storers of current information is the first step in developing an integrated Navy surveillance system. A number of various systems are viewed as sources of information for shore-based centers.

Submarine Surveillance System. Since the early 1980s it was established as an independent system for information collection and processing about the underwater environment and integrated all previous PLO [antisubmarine warfare] organs and resources. It centers in fleet KPs [command centers] are equipped with modern means of automation and store all information about submarine targets, which then must be sent to the shore element information centers. A network of operational centers of antisubmarine warfare surveillance sectors, with their means of command and control of forces and collection of information, are linked to these antisubmarine warfare centers. These sectors include elements of the stationary system for long range hydroacoustical surveillance (SOSUS -- Sound Surveillance System). According to the foreign press it is assigned a most important role in initial detection and discrimination of submarine targets. Maneuver forces of these sectors are shore-based patrol aircraft, surface ships and submarines.

The NSSS (Navy Space Surveillance System) is the most informative system. It provides surveillance of virtually all objects located in the waters of the world's oceans. Satellite information is received by several centers, the main center is located in Dahlgren, Virginia. Processed information is disseminated among interested parties, including the information centers of operational forces, shore-based command centers and the intelligence system.

The Clipper Bay project was the initial plan for the creation of the NSSS system, according to the foreign press. In accordance with this project, the problem of global surveillance for the U. S. Navy was to be solved through electronic surveillance from space. Subsequent study of this problem showed that it could be solved only through the comprehensive use of various sources of surveillance and intelligence.

The U. S. coastal defense surveillance system provides data to an integrated surveillance system about the location of coastal defense ships and aircraft and U. S. commercial vessels. It has its own automated control system with a data bank on its own objects, which other sub-systems can use if necessary. In addition, information will be provided to the ITSS by coastal defense on all objects detected at sea by coastal defense forces and resources and U. S. commercial fleet vessels. Data about the locations of commercial fleet vessels of other countries will be input into the IISS system through the currently operational OSIS system information center in London.

According to the foreign press, information about objects at sea obtained by air defense surveillance resources and U. S. Air Force tactical aviation will

also enter the ITSS (via the lines of coordination between the Navy and Air Force command posts), as will information from the naval surveillance system of U. S. bloc allies (in accordance with existing documents on the exchange of intelligence information).

According to the concept of the Navy command, information centers of the integrated surveillance system will collect and accumulate reports on the locations of ships and aircraft conditionally evaluated and systematized by other (peripheral) systems and resources. These reports will be rigidly formalized and contain the minimum necessary information. Thus, a report about surveillance targets includes: place, time and accuracy of detection; target classification and reliability. These reports will be adequate, American military specialists note, to create a complete data base, depict the situation on the screens of the system and compile information reports for headquarters and forces not having the technical resources of the system. To obtain data on regions and targets contained in the data banks of other systems, it is envisioned that an automated search for the required information may be requested.

One of the most important parts of the integrated surveillance system is the means of depicting the information. Information about targets is displayed on visual display units against a background of a geographic grid, where it can be adjusted or supplemented. The visual display unit makes it possible to view an area 10 x 10 or 2000 x 2000 miles in size. Targets, depending on their nationality, are depicted in various colors used in the U. S. and NATO armed forces. Blue represents their own and allied forces; red represents the enemy; yellow represents neutral countries; green represents targets of undetermined nationality. The portrayal can be transferred to individual display units or to large wall screens within command centers or conference rooms, as well as placed on a map with the aid of a plotting device for a subsequent report or forwarding.

An automated network for dissemination of data between command centers of the global operational command and control system, known as the DDN (Distribution Data Network), the information network of the U. S. Department of Defense, it to be used for mutual exchange of data between the computers of shore and ship-based information centers. It is under development and is expected to enter operation by the end of the 1980s. It is planned that forces (ships) will be included in the information center network by satellite communications links.

The integrated surveillance system being developed for the U. S. Navy, as the foreign press notes, will be universal in its application: for higher headquarters it will support the accomplishment of strategic missions, and for the command groups of large commands and forces it will support the accomplishment of operational-tactical missions.

9069
CSO: 1801/0004

AUTOMATED COMMUNICATIONS SYSTEMS OF NATO NAVY SURFACE SHIPS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 49-51

[Article by Capt 1st Rank S. Kovalenko, candidate of engineering; Capt 1st Rank Ye. Vostrikov, candidate of engineering and Capt 1st Rank (Ret) A. Balagurov: "Automated Communications Systems of NATO Navy Surface Ships"]

[Text] Expanding the scale of their militaristic preparations, ruling circles in the U. S. and the other NATO countries pay the closest attention to equipping their armed forces, including their navies, with modern command, control and communications systems, and to continuously improving them. Reliable and secure real-time naval communications are viewed as a political and military necessity. Foreign military specialists believe that the operational readiness of command, control and communications systems must be no lower than the operational readiness of the forces themselves.

As emphasized in the foreign press, the development of means of communication is being realized in the following main directions: computer-based automation of communications systems; optimization of communications systems and their subsystems in terms of the main operational, structural, technical, maintenance and economic requirements and characteristics; building future communications systems taking into account the possibility of using elements of existing systems in them; replacing a certain portion of them with more modern systems without reducing quality or disrupting the continuity of command and control of the forces.

The use of apparatuses of modular design in modern ship automated communications systems makes it possible to create standardized communications systems for ships of various classes and designations. Ship communications systems use mostly short wave, ultra short wave (including satellite), medium-wave and long-wave communications equipment. As a rule, they include several functionally complete subsystems: command and control, allocation, switching and monitoring, sending and receiving, as well as emergency communications resources. A diagram of a variant of a ship system is shown in Figure 1.

Each subsystem may be furnished in four variants: for large displacement ships (aircraft carriers, cruisers), medium displacement (frigates, destroyers), small displacement (corvettes, cutters) and training systems.

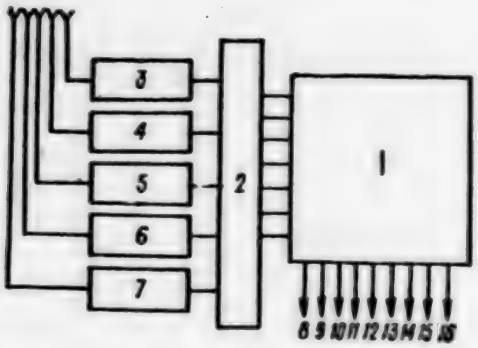


Figure 1. Diagram of variant ship communications system. Subsystems: 1 - command and control, allocation, switching and monitoring; 2 - integrating devices; 3 - short wave and medium wave transmittors; 4 - Band 4 [myriametric] - SW receiver; 5 - ultra-short wave [VHF]; 6 - satellite; 7 - emergency. Communications circuits: 8 - telephone; 9 - loudspeaker; 10 - terminal printer; 11 - computer; 12 - BIP [CIC -- combat information center] and weapons control equipment; 13 - terminal devices and monitoring equipment; 14 - pilot house terminal equipment; 15 - operations room terminal equipment; 16 - helicopter landing equipment.

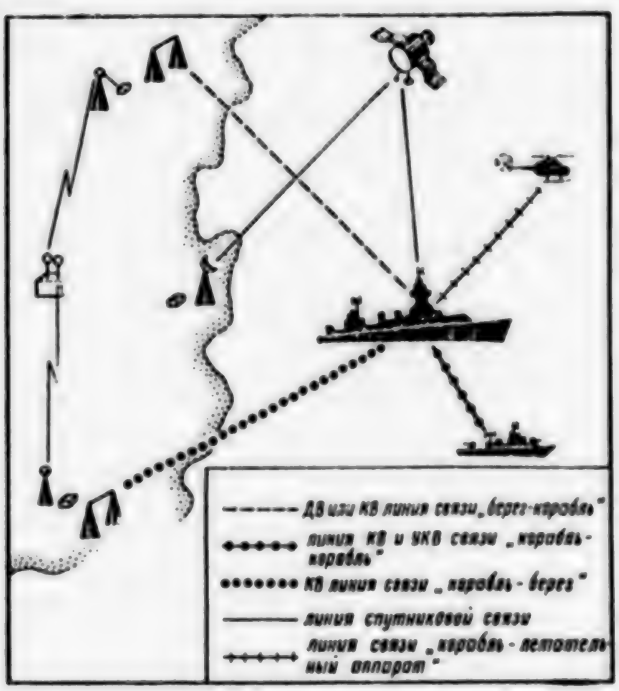


Figure 2. Diagram of Communications Links Provided by Ship Resources

a - long wave (Band 5) or short wave (Band 7) "shore - ship" links; b - short wave and ultra-short wave [VHF] "ship - ship" links; c - short wave "ship - shore" link; d - satellite link; e - "ship - aircraft" link.

The introduction of solid-state elements and modern technology has led to a substantial reduction in the size and cost of ship communications complexes. The time required to detect and eliminate faults has been reduced to 15 minutes. Requirements for the skill level of maintenance personnel have been reduced substantially.

Automated command and control of communication systems is implemented through extensive use of computer equipment, with the aid of which each subscriber on the ship can be connected to the required circuits.

The command and control, allocation, switching and monitoring subsystem, located in the ships' central communications centers, implements priority allocation of information; processes reports received and transmitted; establishes communication circuits; monitors their status and the readiness of circuit apparatuses; formulates reports; protects them against unsanctioned access; distributes them among addressees; issues them in printed form and retransmits. The subsystem monitors received and transmitted information, prepares it for transmission, determines the route for passing it to the addressees, encrypts and decrypts, logs transmissions and stores them in computer memory.

The transmission subsystem provides for transmission of printed, telephone and telegraph signals on medium wave, short wave, ultrashort wave and satellite circuits. Transmission of reports among ships in tactical nets is carried out to a range of up to 300 miles, and in strategic communications circuits to several thousand miles.

In the short wave frequency range, in tactical circuits radio transmitters with a power output up to 100 watts are used; at the operational-tactical level -- up to 250 watts and at the strategic level -- 700-1,000 watts and higher. In the frequency range of from 240 kHZ to 2 MHZ wire and collapsible whip antennas are used which have automatically tuneable (within 10 seconds) autonomous antenna matching devices. In the 2 - 30 MHZ range wideband antennas are used, linked with transmitter power amplifier units through band-pass filters. When necessary, simultaneous operation of several transmitters on one wideband antenna may be provided. In radio transmitters in the communications systems of small ships, which do not have powerful output stages, antennas are connected to the outlets of radio transmitters through matching devices. Master oscillators of radio transmitters have memory banks which make it possible to remember up to 19 previously selected operating frequencies (a 20th is input from the operator control panel). Closed systems for air cooling the power amplifiers are used in radio transmitter devices, where the hot air is cooled by spiral piping through which cold water is admitted.

The command to select the appropriate communications circuits and the power level of the radio transmitter is given by the command and control subsystem, depending on the location of the correspondent.

The reception subsystem provides for receipt of information in tactical and strategic communications circuits. Signals in the 10 kHZ - 30 MHZ range are received by a single small (1-2 meter high) active antenna and pass through

narrow and wide band channel separation filters (0.01 - 1 and 1 - 30 MHZ) and multicircuit active splitters on the receiver input. From the output of these receivers they are sent to the subscribers through the allocation and monitoring system. The operating regime of the receivers is selected according to signals from the command and control system. Signals received in the 0.01 - 1 MHZ frequency range and are converted and translated to the 5.01 - 6 MHZ frequency range. Radio receivers with a frequency range of 1 - 30 MHZ have two inputs: one is a wideband throughout the 1 - 30 MHZ range; the other is a narrowband in the 5 - 6 MHZ sector. The memory units of the radio receivers remember up to 19 previously selected radio transmission frequencies (a 20th is input from the operator control panel).

The reception subsystem usually consist of an active antenna, frequency gauge and radio receivers. Anti-condensation heaters are used on antenna matching devices, duplexers and amplifiers located on the upper deck.

Extensive use of silicon integrated circuits and electronic tuning devices, and the modular design of elements included in the ultra short wave radio communications system make it possible to select automatically communications circuits and guarantees high reliability. Matching and duplexing devices provide for the simultaneous operation of up to 12 radio transmitters or radio receivers on one antenna.

Satellite communications circuits make it possible to realize reliable telegraph and telephone communications over great distances over the 1,250 - 8,400 MHZ frequency range in an FM mode. One (1.8 meter) or two (1.1 meter, set up side by side) gyro-stabilized antennas are used on ships. The transceiver apparatus, as a rule, is located in an unattended compartment; the terminal devices and control panel are found in the central communications post. The ship satellite communications apparatus operates on NATO bloc satellite communication systems. Stations under development must provide telephone, telegraph and facsimile communications and transmission of data in digital form, as well as compatibility with the joint integrated tactical information dissemination system DZhITIDS and with the Link-11 and Link-10 digital communications systems of the NATO country navies.

The system of communications links provided by ship-board resources is shown in Figure 2.

When navy ships are equipped with communication systems the following fundamentally important conditions are considered: communications resources must ensure that the ship is capable of accomplishing its assigned missions; depending on the designation of the ship, communications resources are either grouped (in large displacement ships) among communications posts and command posts, or are concentrated (in small ships) in one radio room, and they ensure rapid delivery of information received to the ship captain. Radio receivers and transmitters are located, as a rule, in separate stations (in radio reception and transmission centers which are as far apart as possible).

According to foreign press reports, one of the most complex problems in development, deployment and operation of ship communications systems is ensuring electromagnetic compatibility (EMS--elektromagnitnaya sovmestimost),

both of simultaneously functioning transmission and reception equipment, and of communications equipment with other electronic systems on the ship.

In accordance with the requirements of electromagnetic compatibility standards, measures are taken at all stages of ship design and construction to eliminate or reduce electromagnetic interference, which is created by the hull and the ship's upper deck apparatuses and structures. Long range efforts to ensure electromagnetic compatibility of ship communications equipment are aimed at improving the quality and increasing the quantity of simultaneously operating radio communications circuits on the ship, by reducing the frequency intervals between circuits; increasing the selectivity of radio receivers; narrowing the zone of radiation of radio transmitters; reducing the number of radio antennas; finding the optimal places for them to be located (based on the results of modeling) and improving the effectiveness of contact interference suppression caused by the ship's upper deck apparatuses. They are also aimed at developing and improving standards for ensuring electromagnetic compatibility of ship communications complexes and systems.

Implementing a complex of measures to ensure electromagnetic compatibility during the simultaneous operation of short wave communications circuits made it possible to reduce the frequency intervals between transmission and reception (transceiving) circuits of systems to 2.5 percent, and between receiving circuits to 100 kHZ.

Information published abroad indicates that the U. S. and other NATO countries are working intensively to create a unified naval communications system, an integral part of which are modern, automated ship communications systems, intended to ensure command and control of forces and individual ships located in various regions of the world's oceans.

9069
CSO: 1801/4

U. S. MARINE CORPS EXPEDITIONARY BATTALION

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 52-53

[Article by Capt 2d Rank A. Georgiyev: "U. S. Marine Corps Expeditionary Battalion"]

[Text] The Marine Expeditionary Battalion is a tactical subunit. It is intended to take part in small scale assault operations (raid type) conducted for reconnaissance-sabotage or demonstration purposes.

Under peacetime conditions expeditionary battalions are elements of U. S. Marine Corps forward deployed groupings of the 6th and 7th Fleets in the Mediterranean Sea and the western part of the Pacific Ocean, and are called upon to carry out punitive and police functions. Periodically they are found on assault ships of operational amphibious groups in the Caribbean Sea, and are also transferred from the western part of the Pacific Ocean or from the Mediterranean Sea into the Indian Ocean.

In October 1983 the 22d Marine Expeditionary Battalion participated in aggression against the independent state of Grenada. From 1982 through 1984 the 22d and 24th Marine expeditionary battalions, in turn, were part of the multinational occupation forces in Lebanon.

An expeditionary battalion includes a battalion assault group (a Marine Corps battalion with reinforcing subunits), a composite air squadron and a battalion rear services group (see chart). A Marine expeditionary battalion is commanded by a Marine Corps colonel. The overall personnel strength of this formation reaches 2,500 men, of whom: 891 are in the Marine battalion; up to 400 in the composite air squadron; approximately 500 in the rear services support group; and up to 650 in reinforcing subunits (field artillery battery, a tank and a reconnaissance platoon on LAV combat vehicles, an antitank squad, etc.). In addition, subunits of special purpose forces (reconnaissance-sabotage) of the fleets may be attached to the expeditionary battalion.

1 - headquarters
2 - commander, marine expeditionary battalion
3 - battalion assault group
4 - composite air squadron
5 - battalion rear services group
6 - companies
7 - platoons
8 - headquarters and services
9 - weapons
10 - field artillery battery
11 - tank
12 - reconnaissance
13 - marine
14 - anti-tank squad
15 - amphibious armored personnel carriers
16 - LAV combat vehicle platoon

Battalion armaments are shown below:

M60A1 tanks	5
LAV combat vehicles	12
Amphibious APCs	14
155mm towed howitzers	6
81mm mortars	8
60mm mortars	9
Tow ATGM launchers	8
Dragon ATGM launchers	32
Stinger air defense missile launchers	20
AV-8A and B Harrier aircraft	6
Fire support helicopters	6
Assault transport helicopters	24

When an expeditionary battalion is formed, personnel, weapons and equipment are allocated from the Marine Corps division, air wing and rear support group of the respective fleet. After the Marine expeditionary battalions have accomplished their assigned missions they are returned to their units and large units. The foreign press reports that if required up to 12 expeditionary battalions can be formed from regular Marine Corps forces in the Atlantic and Pacific fleets.

At sea the Marine expeditionary battalion is deployed on four assault ships (a general purpose assault ship or assault helicopter carrier; assault helicopter carrier dock; assault transport dock and tank assault ship). Battalion engineer equipment, as well as primary reserves of MTO [materiel support] for 3-5 days of combat operations are usually located on an assault supply transport ship.

Landing the Marine Expeditionary Battalion on shore is accomplished, as a rule, by a combined method: through the use of amphibious assault landing resources (amphibious armored personnel carriers, landing craft, air cushion craft) and assault transport helicopters. According to the Western press, the assault echelon of the battalion landing group is usually landed in 50-70 minutes, and the entire Marine Expeditionary Battalion in 4 hours. The size of the landing beach for an expeditionary battalion on the coast is 1-2 km across the front and 3-5 km in depth.

9069
CSO: 1801/4

CAPTOR ANTISUBMARINE MINE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 53-55

[Article by Capt 1st Rank I. Sukhanov, candidate of military sciences, docent; Capt 3d Rank A. Kolpakov, candidate of military sciences; and Capt Lt P. Yevdokimov: "CAPTOR Antisubmarine Mine"]

[Text] The U. S. Navy command, which is rapidly building up the power of the Navy, pays much attention to the development of mine weapons. Western specialists believe that the Mk60 CAPTOR (capsulated torpedo) mine, which is intended to strike submarines below the surface, occupies a special place among these various types of mine weapons.

Scientific research work on the CAPTOR project was conducted in the U. S. Navy back during 1960-1967. Then it was halted and resumed in the early 1970s. At first development of the mine was based on the Mk37 Mod 0, with its active-passive homing system, which was placed in inventory in 1952. The torpedo was placed in a container which was set at a depth of up to 50 meters. Experimental lots of mines were manufactured and tested in 1966-1967. However, subsequent efforts to develop the mine based on the Mk37 torpedo were halted, since by this time the latter was obsolete.

In 1971 competition was again announced for development of the CAPTOR mine, which was to satisfy the following requirements: the series production Mk46 Mod 1 torpedo (placed in inventory in 1964) was to be used as the contact element; it was to be set at the assigned depth automatically; it was to have a device to identify submarines and their simulators; it was to possess high anti-minesweeper characteristics; it was to be remotely switched to and from combat ready status, as well as to be able to be self-destroyed by a coded signal; it was to have a term of combat service in the 2-5 year range; and it was to be deliverable by aircraft (helicopters), surface ships and submarines.

In March 1972 Goodyear Aerospace was selected to be the lead organization. It began development and manufacture of experimental models of the new mines. Experimental laying of the CAPTOR mines was carried out from A-6, A-7, P-3C and B-52D aircraft, submarines and cargo and assault transports.

The foreign press reported that in February 1975 the Mk60 CAPTOR mine was accepted into the U. S. Navy inventory. It has the greatest zone of destruction of all mines in the U. S. naval arsenal and can be used at depths up to 800 meters. In contrast to previous antisubmarine mines with contact and noncontact fuses, which operate when a submarine comes into proximity to the mine, the CAPTOR apparatus is capable of detecting a target at a distance of up to 1,000 meters, after which a torpedo is released, which conducts circular search and overtakes and destroys the target.

According to the foreign press, in 1975 63 mines were purchased, in 1980 1,140, in 1982 4,000, in 1983 300, and purchase of 300 mines in 1984 and 475 mines in 1985 was planned. According to initial plans, by the end of the 1980s 6,000 mines were to be manufactured.

The main elements of the Mk60 CAPTOR are: container with torpedo and launch system; anchor device with system for automatic setting of the container at the desired depth; and, noncontact apparatus of the automatic target detection and classification system.

The container is to house the Mk46 antisubmarine torpedo. It also contains the torpedo launch system and the noncontact apparatus of the automatic target detection and classification system. The container is manufactured from an aluminum alloy and equipped with two covers, upper and lower; it is approximately 4,000 mm long and is 534 mm in diameter. It is buoyant and is vertically oriented.

At present the Mk46 Mod 4 small caliber antisubmarine torpedo is used as the mine's warhead. Its tactical and technical specifications are as follows:

Caliber, mm.....	324
Length, mm	2,590
Weight, kg.....	230
Weight of explosive charge, kg..	43.5
Speed, knots.....	up to 45
Range, km.....	up to 11
Maximum depth, meters.....	up to 450
Guidance system range (acoustic, active-passive), meters.....	1,000-1,500

The anchor device is designed to set the container at the indicated depth automatically and hold it in place. It consists of an anchor and delivery mechanism. The latter is affixed to the lower part of the container and includes a mooring rope drum, hydrostatic sensors, which serve to separate the container from the anchor at the established depth and which deliver the former to the indicated depth, an induction sensor and electromagnet for locking the mooring rope drum.

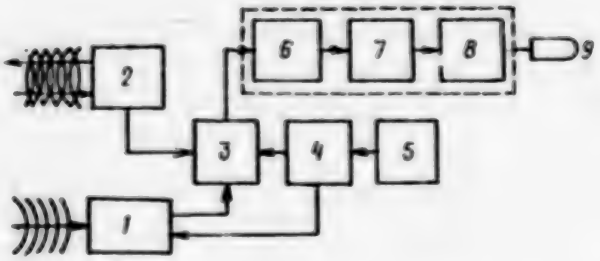


Figure 2. Block diagram of Mk60 Captor mine: 1 - passive acoustic circuit; 2 - active acoustic circuit; 3 - logic structure; 4 - battery feed unit; 5 - safety devices; 6 - valve for flooding container with water; 7 - hydrostatic sensor; 8 - container cover lock; 9 - torpedo

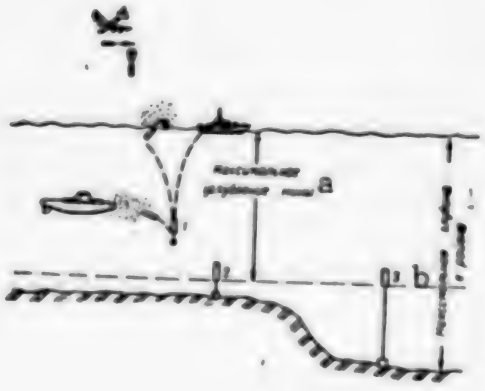


Figure 3. Diagram for emplacement of Mk60 Captor mine: 1 - separation of anchor at desired depth; 2 - setting mine at bottom; 3 - setting mine at desired depth.

a - maximum depth of mine
b - maximum depth in area

A combination of hydrostats which are adjusted to various hydrostatic pressures sets the container with the torpedo at the desired depth, which depends on the depth of the location. When the depth of the sea is up to 230 meters the container is set near the bottom (7.5 meters from the bottom). In areas with depths from 230-460 meters the depth of the container is equal to half of the depth of the location, and at depths from 460 meters to the permissible depth (800 meters) it will be close to the maximum (305 meters).

The noncontact apparatus of the automatic target detection and classification system determines the existence of a target within the system operating range and target direction and distance. It classifies the target according to the "friend - foe" principle and launches the torpedo from the container to the target area. The primary functional units are found in this apparatus (Figure 2): passive acoustic circuit (AK); active acoustic circuit; logic unit.

The passive acoustic circuit is designed to receive and process high frequency acoustic signals. When a noise-making target (submarine or surface ship) appears in the operating area of this circuit it activates, determines the existence of a target in the zone of reaction and the direction to the target. The logic unit turns on the passive acoustic circuit and plugs in to the operation of the active circuit, which makes it possible to distinguish a submarine located under water from a surface vessel and from submarine acoustic field simulators, determine the distance to the submarine and classify it according to the "friend - foe" principle. According to the foreign press, target nationality is determined in the following way. The active acoustic circuit emits into the water coded acoustic impulses in directions in which surface vessels located in the zone of reaction of the passive acoustic circuit will not enter the zone of operation of the active circuit, and submerged submarines, to the contrary, will be in this zone.

Friendly submarines, equipped with a hydro-acoustic identification system, automatically re-emit the coded acoustic impulses in the opposite direction. The logic unit of the mine checks the code of the signal which it receives, turns off the active acoustic circuit and turns on the passive circuit.

If an enemy submarine is in the zone of reaction of the active acoustic circuit, the reflected signal it receives will not correspond to the code of emitted acoustic impulses. Then the logic unit determines the distance to the detected target, classified as an enemy submarine, and issues the command to fill the container with water, open its covers and launch a torpedo.

If a submarine acoustic field simulator turns out to be in the zone of reaction of the active acoustic circuit, the echo signal from this simulator, received by the given circuit, will turn out to be inadequate to activate it. In this case the logic unit turns off the active acoustic circuit and turns on the passive circuit.

The combat employment of the Mk60 CAPTOR mine is as follows. When it is emplaced the mine is separated from its carrier and is submerged to the depth of the section of anchor. Its installation is considered complete when the anchor is in the seabed and the container with torpedo occupies a vertical position at the assigned depth (Figure 3).

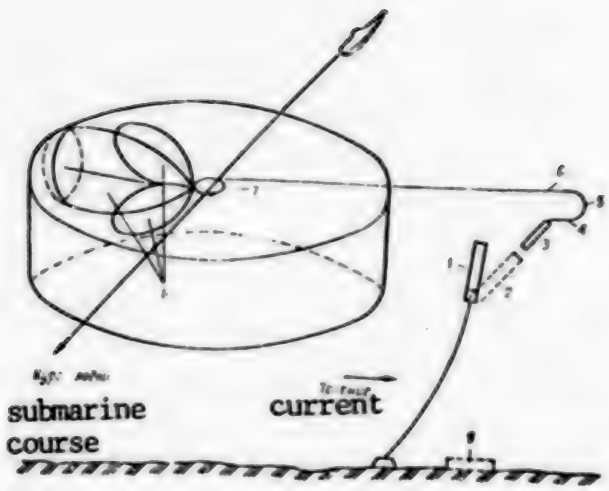


Figure 4. Operating principles of Mk60 Captor mine: 1 - container position before torpedo launch; 2 - container position at moment of torpedo launch; 3 - torpedo position after exit from container; 4 - torpedo circulation in the verticle plane; 5 - torpedo turn to horizontal plane on its attack run; 6 - horizontal path of torpedo to target; 7 - circulation of the torpedo when seeking the target; 8 - radio beams of torpedo GSN ["homing device"] in listening regime; 9 - container position after exit of torpedo.

After the safety devices are actuated the Mk60 mine is shifted to its combat position and the automatic target detection and classification system begins to operate. After classification of a detected target, for example an enemy submarine, the container is filled with outboard water through a valve. As a result, its center of gravity shifts and the container lists, which creates favorable conditions for launching a torpedo. After the external hydrostatic pressure is equalized with the pressure within the container its cover is opened. Simultaneously, the torpedo motor is triggered and it passes out of the container and moves to search depth. The container is completely filled with water, loses its remaining buoyancy and falls to the bottom (Figure 4). The search depth of the torpedo is determined by the assigned depth of the container. As the torpedo leaves the container its homing system begins to function in passive regime and it conducts a programmed search for the target.

Judging by foreign press reports, the Mk46 Mod 4 torpedo has several variant programmed search trajectories. One of these is circling until the moment that the homing system functioning in passive regime locks onto the target. After target lock-on, the GSN ["homing device"] is switched to operate in the active regime, in order to eliminate the possibility that the torpedo will guide on submarine acoustic field simulators. If it is not a false target, the torpedo is aimed toward it and approaches until the noncontact fuse actuates, exploding the torpedo charge. The foreign press indicates that the Mk46 Mod 4 also has an impact (contact) fuse, which explodes its charge when it strikes the target.

In its future plans the U. S. Navy intends to improve the CAPTOR mine, and then also develop a new model.

The Mk60 mine is being improved to increase the sensitivity of the Mk46 Mod 4 torpedo guidance system; reduce its noise; improve the body of the mine in order to bring the maximum container depth to 800 meters; increase the reaction radius; and improve the selectivity and resistance to jamming of the automated target detection and classification system.

The U. S. Navy command is placing great importance on the CAPTOR mine. It plans to employ it widely in a possible war at sea, in particular when creating deep water antisubmarine mines, closing the egress of Soviet submarines to the Atlantic and Pacific oceans.

9069
CSO: 1801/4

MILITARY-GEOGRAPHIC DESCRIPTION OF BELGIUM

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 67-72

[Article by Col A. Alekseyev: "Military-Geographic Description of Belgium"]

[Text] Belgium is one of the economically developed Capitalist states of Western Europe. It is a member of NATO, the West European Alliance, European Economic Community, Euratom [European Atomic Energy Community], European Space Agency, United Nations and other international organizations. Along with the Netherlands and Luxembourg it forms the Benelux regional economic alliance.

The Belgian government participates most actively in strengthening the aggressive NATO bloc and in developing mutual coordination with its partners in this organization, most of all with the U. S. The highest command organs of the North Atlantic Alliance are located on its territory: headquarters of the NATO Council, Military Planning Committee, Military Committee, Headquarters of the NATO Combined Armed Forces (OVS) in Europe, headquarters of the NATO aviation long range radar detection, command and control command, as well as logistics facilities of the U. S., UK and FRG armed forces.

The Belgium armed forces are included in the NATO Combined Armed Forces and their operational and military training is conducted taking into account the views on the possible nature of future war accepted in NATO.

Yielding to Washington's demands, Belgium continuously increases its expenditures aimed at improving its military economic capability, strengthening the combat capabilities of its armed forces and further developing elements of its infrastructure. Belgium's military expenditures in 1985 reached $2.5 billion (taking into account funds allocated to military assistance given to other countries, to developing its infrastructure and other objectives, associated with maintaining the NATO Combined Armed Forces), of which $0.8 billion was allocated to development and technical equipping of the ground forces; $0.6 billion to the air forces and $0.1 billion to naval forces. Military expenditures constitute more than 8 percent of the country's total state budget.

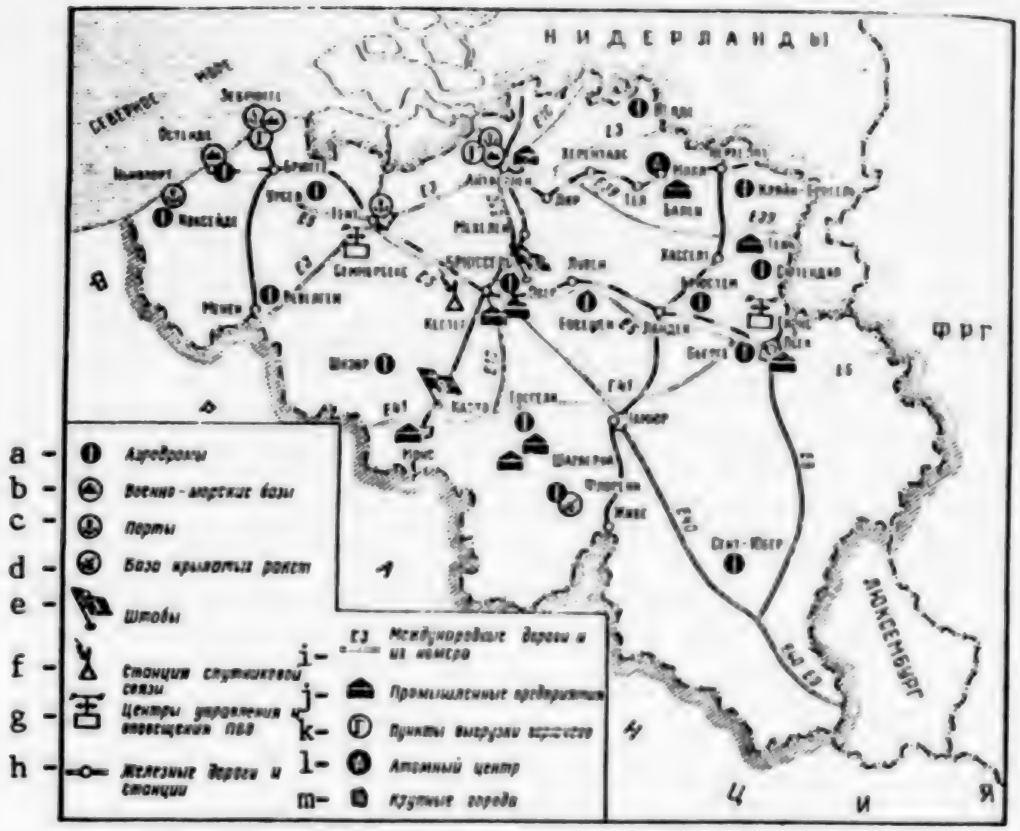


Figure 1. Basic Elements of the Belgian Infrastructure

a - airfields
b - naval bases
c - ports
d - cruise missile bases
e - headquarters
f - satellite communications station
g - air defense control and warning centers
h - railroads and railroad stations
i - international roads and their numbers
j - industrial enterprises
k - fuel offloading points
l - atomic energy center
m - major cities

Physical Geography. The country is located in the northwestern part of the European continent and its shores are washed by the North Sea. It extends 175 km from north to south and 220 km from east to west, an area of 30,500 square km (Figure 1).

In the north Belgium borders the Netherlands, in the east the FRG, in the southeast Luxembourg and in the south and southwest France. The overall length of its land borders is 1,379 km, and of its sea borders is 65 km.

Its relief gradually rises from northwest to southeast. Lowlands and plains predominate. The Flanders lowlands extend through the northern and northwestern part of the country, and in places are located 3-4 meters below sea level. In the southeast is located the Ardennes low mountain range, which is up to 400 meters in height. The high point is the Beautrange Mountain at 694 meters. The sea coast is level and sandy and there are no natural harbors or bays. In places there are dikes which protect coastal areas from flooding.

Forests occupy approximately 18 percent of the area of the country. Substantial ranges have been preserved only in the Ardennes, where oak, beech, pine and birch grow. Groves and gardens are widespread. The soils are predominantly brown forest soils, frequently podzolic.

Of the numerous rivers, the Schelde and Meuse with the left stream of the Sambre have been placed in commercial use. Along with the canals they form a single navigable system. The rivers do not freeze in winter. The mouth of the Schelde is a convenient moorage for naval vessels.

The Belgian climate is moderate and humid. Winter is mild, permanent snow cover does not form and the average temperature in January is +3 degrees Centigrade. Summer is warm, the average temperature in July is +18 degrees Centigrade. There are few sunny days during the year. Air masses moving from the Atlantic Ocean predominate. Annual precipitation reaches 700-800 mm.

Population and State System. The country has 9.9 million people (in 1985), of whom 4.8 million are men. There are 3.8 million employed. The population density is rather high; an average of 320 people per square km. However, settlement is not uniform. In the industrial regions the density reaches 500, while in the Ardennes it is approximately 50 people per square km. The major cities are Brussels (1 million residents), Antwerp (490,000), Gent (238,000), Charleroi (219,000) and Liege (207,000).

The national composition of the population is not homogenous. Belgians are divided into Walloons (42 percent), living in the southern part of the country, and Flemish (57 percent), who populate the northern and central regions. The official languages are French and Dutch.

Administratively Belgium includes nine provinces, consisting of 589 communes. The provinces are led by governors designated by the king.

Belgium is a constitutional monarchy. The constitution was approved in 1831. A number of changes have been incorporated in recent years. The king is head of state. The present Belgian king is Baudouin, who took the throne in 1951.

Legislative authority is exerted by the king and the parliament. The parliament consist of two houses -- the senate and the house of representatives. The 212 deputies in the house of representatives are elected by direct voting, according to a system of proportional representation. There are 181 senators elected to the senate: 106 by direct elections, 50 by provincial councils and 25 co-opted by the senate itself. The term of office in both houses is 4 years. The government has executive power. The king names the prime minister. They jointly form the government. The present coalition government was formed in November 1983 and is headed by Wilfried Martens.

The country has several political parties. The Communist Party, party of the working class, was established in 1921 (14,000 people). It is at the vanguard of the workers' struggle for social justice, peace, democracy and national independence. The Socialist Party was formed in 1885, reflects the interest of the petty bourgeoisie and favors active participation in NATO (196,000 members). The Christian People's Party was formed after a split in the United Christian Party and is based on the financial and industrial bourgeoisie, the church and Christian trade unions, and has great influence on the Flemish population (186,000 members). The Freedom and Progress Party has been active since the 1830s-1840s. It defends the interests of the big industrial and financial bourgeoisie and medium sized employers (100,000 party members).

The National Walloon Association is a nationalist group formed in 1968. It favors turning Belgium into a federated state. The Democratic Front of Francophones was organized in 1965 and is influential in the country's capital. The Volksuni is a Flemish national party. It was created in 1954 and expresses the interests of the Flemish bourgeoisie and intelligentsia. It numbers 360,000 members.

The church has a great influence on the population. The overwhelming majority of believers are Catholic. The bourgeoisie uses the press, radio, television and other means to exert ideological influence on the masses. There are 38 daily newspapers published in the country, of which 23 are in French. Telephone communications are well developed. The radio broadcasting network includes 29 radio stations, and there are 17 television stations.

Industry. Belgium is a highly developed industrial country with rather intense agriculture. It produces approximately 1 percent of the industrial production of the Capitalist world. Large, monopolistic associations dominate the economy. A substantial part of the funds in the automobile, electronics and petroleum industries are foreign capital, mainly U. S. and British.

The main branches are ferrous and nonferrous metallurgy, machine building and electrical engineering. Large metallurgical factories are located in the cities of Charleroi, Liege, Marsinel, [Seren], Mons and Marchennes. Production of nonferrous metals depends on the import of their concentrates and is centered in the areas of Olain, Hoboken, Balain and Alain.

Automobile assembly takes place in factories in the cities of Brussels, Gent and Malain, and heavy electrical equipment, turbines, transformers and power cable are produced at firms in Brussels, Antwerp, Liege and Charleroi.

The chemical industry specializes in sulfuric acid, nitric acid, organic compounds and nitric and phosphoric fertilizers.

The following information for industrial production in Belgium in 1984 is provided by the foreign press (in million tons): steel -- 11.1; cast iron -- 9.0; refined copper -- 0.4; zinc -- almost 0.3; lead -- 0.13; cement -- 5.7; petroleum products -- 20.7. Approximately 917,000 automobiles were assembled and 52.0 billion kilowatt hours of electric power were produced.

The military industrial branches produce artillery and small arms weapons, ammunition, armored and automotive equipment and electronic apparatuses. The centers of industrial industry are Brussels, Liege, Mons and Charleroi. An atomic energy scientific research center is located in Molles. Belgium exports ferrous and nonferrous metals, industrial equipment, petroleum products and textile and chemical goods. The country imports nonferrous metal concentrates, iron ore, rubber, machine tools, diamonds, crude oil, forest products, cotton and wool. Its main trading partners are the FRG, France, the Netherlands and the U. S.

Agriculture is distinguished by a high grain crop yield and high productivity of animal husbandry, its main branch. It accounts for up to 70 percent of the value of all agricultural products. The country has 3.1 million head of cattle, 5.3 million pigs, 82,500 sheep and 29,900 horses.

Field crop cultivation occupies a secondary place. In 1984 the harvest of grain crops constituted (in thousands of tons): wheat -- 1,006; rye -- 24; barley -- 704; oats -- 145; potatoes -- 1,254 and sugar beets -- 5,210. Overall, according to Western specialists, agriculture does not completely meet the needs of the population for food, commodities and raw materials.

The Belgium armed forces consist of the army (68,000 men), air force (19,800) and navy (4,500). The term of service is 10 months.

The army has two motorized infantry divisions, a "commando" parachute regiment and other units and subunits. According to the foreign press, their weapons include more than 330 Leopard-1 tanks and almost 120 Scorpion light tanks; 5 Lance guided missile launchers; approximately 70 helicopters and 5 army aviation fixed wing aircraft. The trained army reserve numbers 160,000 men.

The air force includes eight squadrons: five fighter-bomber squadrons (54 Mirage-5B aircraft, 22 F-16A and 14 F-16B aircraft); two air defense fighter squadrons (34 F-16A and 5 F-16B aircraft) and 1 reconnaissance squadron (18 Mirage-5BP, which it has planned to replace with F-16s). The air forces also include 4 Nike-Hercules ZUR [air defense missile] squadrons (a total of 36 launchers) and 2 transport squadrons (12 C-130H, 2 Boeing 727, 5 Merlin-3A and 3 HS-748 aircraft). The trained air force reserve numbers 14,000 men.

Naval vessels include 4 URO [guided missile weapon] frigates; 29 minesweepers; 14 auxiliary vessels and cutters. The trained navy reserve numbers 4,500 men.

In the views of NATO military specialists, the territory of Belgium is well equipped operationally. Measures to prepare it are carried out according to both plans of Belgian national armed forces and programs of the NATO Combined Armed Forces.

The airfield network numbers 32 airfields, 17 of which are suitable for use by modern combat and military transport aircraft. As a rule, major airfields have one runway no less than 1,800 meters long and 45 meters wide with concrete or asphalt cover taxiways, group and individual aircraft parks, fuel depots and other articles of material and technical support, as well as various facilities for maintenance personnel and equipment.

There are 13 airfields at the disposal of the Belgian air force command. The most important and well equipped are: Beauvechain, [Briust], Bierset, Velde, Kleine-Brogel, Koksijde, St.Hubert, [Sijtendal], Ursel, Florennes and Chevre. With dispersed aircraft spacing (one squadron per airfield) these airfields hold 230-250 aircraft.

In addition, the country has four major civilian airfields -- Brussels, Vevelgem, [Gosseli] and Oostende, which if necessary can also be used for military purposes.

In recent years several military airfields and the Brussels capital airport have been under reconstruction.

Belgian naval bases and ports are intended to support military training and the daily activity of naval forces. The naval bases of Antwerp, Zeebrugge and Oostende, and the commercial port of Antwerp, Gent, Zeebrugge and Nieuwpoort, which have modern loading and unloading equipment, have been developed on the North Sea Coast.

The naval base and port of Antwerp are located 64 km from the North Sea at the mouth of the Schelde River, and are suitable for basing commercial vessels and naval warships of all classes. The total length of the wharves is 106 km and their maximum depth is 14.65 meters. Ship repair enterprises make it possible to repair ships of all classes. The port has approximately 450 cranes, including 20 floating cranes and 70 mobile cranes. Its capacity is approximately 90 million tons per year. It is the largest container and petroleum port in Western Europe.

The naval base and port of Zeebrugge provide for basing main classes of commercial and military ships. The overall length of its wharves is 3.2 km and their depth is up to 13 meters. Ship repair enterprises repair ships of medium displacement. Port capacity is 15 million tons per year. The Oostende naval base is the permanent base for a large part of Belgium's naval forces. It is located at the exit from the Pas de Calais Strait in the North Sea. The overall length of its wharves is 9 km and the maximum depth of the wharves enables it to accept ships with a draft up to 8.5 meters. Ships up to destroyer size inclusively can be repaired in its shipyards.

The ports of Zeebrugge and Gent are used to receive American ships with weapons and military equipment.

A missile base in Belgium is being developed for the U. S. ground based cruise missiles. The decision to deploy 48 such missiles in the country was made in 1979 at a session of the NATO Council. Construction of a missile base began in 1985 near the Florennes Air Base. The first unit of American cruise missiles (4 launchers with 16 missiles) arrived at Florennes in early 1985. It is expected that deployment of the remaining 3 units will be completed by 1988.

Command, Control and Communications Organs. The highest organs of military and political leadership of the national armed forces are located in Brussels. The headquarters and protected command and control posts for the supreme commander of the NATO Combined Armed Forces in Europe are located in Casteau (50 km southwest of Brussels). Several dozen administrative and maintenance buildings, an underground bunker and a radio relay communications node are located in isolated territory.

In Evere (a suburb of Brussels) the headquarters of the NATO Council, the Military Planning Committee and the Military Committee are based. These are the organs which examine and decide the main political and military problems of the North Atlantic Bloc.

The main center of the NATO satellite communications system is also located near Brussels. A satellite communications station is deployed at Kester. They provide telephone and telegraph communications for the highest NATO military and political leadership.

Command and control are realized with the aid of the NATO Ice High tropospheric communications stations, and on radio relay and cable communications lines. Short wave radio communications resources are in reserve. Air defense of Belgian territory is accomplished by forces and resources of the central zone, NATO combined air defense system in Europe (OTAK [as written] Air Defense Region 2). Active air defense weapons include fighter aircraft, Nike-Hercules air defense guided missiles, Improved Hawk missiles and air defense artillery.

Passive means provide detection, notification and collection of data on the air situation and guide fighter-interceptors and air defense weapons to air targets. Radars and air defense centers are located in the areas of Glons (15 km northwest of Liege) and Semmerzake (15 km south of Gent).

Routes of Communication and Transport. Belgium has one of the best developed ground transport lines of communication of the West European states.

The overall length of West European gauge rail lines in operation is 3,840 km, of which 2,590 km are 2-track. Some 1,840 km of roads are electrified. There are 13.5 km of railroads per 100 square kilometers of territory. They are operated by the state company (Societe Nationale Chemins de Fer Belge.)

In wartime, deliveries of troops and military equipment by rail will be organized and coordinated by an inter-ministerial commission on railroads, a

central buro of military deliveries, a transport commissariat, directorate of military deliveries, as well as the railroad service.

The Belgian railroad network is linked with the roads of contiguous states. Twenty railroads run to France, 6 to the FRG, 6 to the Netherlands and 1 to Luxembourg.

The rail lines Neerpelt - Hasselt - Landen - Namur - Givet; Roosendaal (Netherlands) - Antwerp - Brussels - Mons - Maubeuge (France); and Zeebrugge - Menen - Lille (France) run in a radial direction. Rail lines running Antwerp - Lierre - Herentals - Mol - Weert (Netherlands); Oostende - Gent - Brussels - Landen - Liege intersect the country from west to east. Deliveries of goods by trans-European container trains are accomplished on lines running Antwerp - (Mets); Zeebrugge - Antwerp and Zeebrugge - Achen (FRG). Important railroad junctions are Brussels, Antwerp, Liege, Namur, Gent, Mons, Charleroi.

The railbed structure permits the movement of freight trains weighing approximately 2,000 tons. The speed of passenger trains can reach 120 km per hour and that of freight trains 80 km per hour. There are many artificial structures (bridges, overbridges, tunnels) on the railroads. The largest bridges cross the Meuse, Schelde and Sambre rivers and the Albert Canal.

Belgian railroad rolling stock numbers approximately 300 electric engines, approximately 900 steam engines and 43,100 freight and 3,800 passenger cars. Maintenance and technical personnel number 55,000.

The highway network is well developed and includes up to 125,000 km of roads of various classes. On the average there are 410 km of roads per hundred square km. Belgium has the highest road density in Europe.

Railroads are divided into state, provincial and district. The overall length of state roads is 13,100 km, including 1,460 km of high speed highways (width of the thoroughfare is 9-12 meters); the overall length of provincial roads is 1,400 km (width 5-7 meters) and there are 110,200 km of district roads. The highways usually include 2-3 lanes in each direction, a divider strip and reinforced curbs. Their rated capacity is approximately 30,000 automobiles per day. It is much lower for provincial and district roads.

Seven international highways (E3, E5, E9, E10, E39, E40 and E41) intersect Belgian territory. Automotive transport between Belgium and Great Britain is accomplished with the aid of the Oostende - Dover ferry crossing. Three ferries serve this 105 km long line; a crossing takes 4 hours.

The road profile is smooth; there are almost no sharp descents and rises. A large number of bridges and viaducts has been built on the roads, especially across such obstacles as the Meuse and Schelde rivers.

In the country are registered 261,100 trucks, 3.3 million automobiles, 17,800 buses, 28,300 prime movers of various types and 136,900 agricultural tractors.

Belgium has a developed network of internal waterways, the overall length of which is 1,956 km: 1,064 km of rivers and 892 km of canals. Some 255 km of

canals and 103 km of rivers are navigable for ships with tonnage higher than 1,500 tons. A large part of the waterways is used by ships of lower tonnage.

There are almost 2,200 dry cargo ships, more than 300 tankers and approximately 280 tow boats of various types presently in operation.

The Schelde River (with its tributaries the Dender, Rupel, and Leie and the Meuse River (with its tributaries the Sambre and Ourthe, and a system of canals, the most important of which are the Albert, which links the ports of Antwerp and Liege (125 km long), the Boot - Charleroi (104 km) and the Brugge - Gent (56 km), constitute the main waterways.

In 1983, 91,200,000 tons of various goods were hauled on the inland waterways.

In accordance with the NATO infrastructure development program, the country has built military pipelines intended mainly for the transport of fuel for airfields where NATO aviation is based, both on Belgian territory and in other Central European countries. Pipeline capacities permit peacetime use by civilian consumers.

Organizationally, the Belgian pipeline system is part of the NATO pipeline system in the Central European theater. The fourth regional directorate of the pipeline operation service is responsible directly for the operation of pipelines on Belgian territory. Its headquarters is located in the city of Leuven. The Belgian part of the pipeline extends approximately 750 km. Along the line 10 POL [petroleum, oils and lubricants] depots and 18 stations have been built. It is maintained by 300 specialists and workers of various types.

Fuel is delivered to the system at the offloading points in the seaports of Antwerp and Zeebrugge. Fuel of three types -- jet aircraft fuel, diesel fuel and gasoline for automobiles -- is transported by the NATO pipelines.

Besides purely military pipelines, two main commercial petroleum pipelines have been laid in Belgium: Antwerp -- Rotterdam (Netherlands), 105 km long (pipe diameter 834 mm); and, Zeebrugge - Gent, 55 km long (508 mm pipe diameter). Crude oil is delivered to petroleum refineries by these pipelines. Local pipelines also exist. The overall length of Belgian commercial pipelines is 261 km. Fuels and lubricants are stored in military depots and at petroleum refineries and seaports.

Along with military depots intended to satisfy the current requirements of the national armed forces, there are also storage complexes in Belgium which belong to the armed forces of the U. S., Great Britain and the FRG.

These are the main military economic and geographical aspects of modern Belgium, the military and political policy of which is directed at further strengthening the aggressive NATO bloc.

9069
CSO: 1801/4

U. S. 10TH LIGHT INFANTRY DIVISION

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 75-76

[Article by Lt Col I. Aleksandrov: "U. S. 10th Light Infantry Division"]

[Text] Within the framework of the army reorganization presently underway in the Pentagon pursuant to the Army-90 program, great attention is being paid to increasing army strategic mobility. One way, which substantially reduces the time required to move large units from the continental U. S. to trans-oceanic theaters of military operations, is the creation of light infantry divisions. According to American specialists, a total of approximately 500 C-141 aircraft will be required to move such a division (more than 1,400 are required for an ordinary infantry division).

The foreign press reports that organization of the regular army 10th Light Infantry Division has begun. It will have two brigades, and in case of mobilization deployment it will be fleshed out with a National Guard separate infantry brigade. The division headquarters (Maj Gen W. Carpenter was named commander in 1985), one brigade and several subunits of the division base are deployed at Fort Drum, New York. The 2d Brigade will be stationed at Fort Benning, Georgia until housing is ready at Fort Drum.

The foreign press notes that the division is based on the former 10th Mountain Division, which took part in combat operations in Italy back in World War II and was disbanded following the war. American specialists do not exclude that, after all organizational measures are completed, it will be designated for operations under mountainous and arctic conditions.

The army command plans to complete the deployment process by 1988. The numerical strength of the division is 10,768 men. It is planned that the division, including the National Guard Brigade, will have lighter weapons and military equipment, including 54 towed 105 mm howitzers; 36 106.7 mm mortars; 206 Tow and Dragon ATGM launchers; 522 M203 RPG [antitank rocket launchers]; 18 Vulcan self-propelled antiaircraft launchers; 90 Stinger PVRK [antiaircraft

missile system] fire crews; 99 Army Aviation helicopters; 870 1 1/4 ton M966 high mobility vehicles; 135 motorcycles and other weapons.

9069
CSO: 1801/4

NEW AIRCRAFT DELIVERED MINES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) pp 76-77

[Article by Col S. Perov: "New Aircraft Delivered Mines"]

[Text] The JP233 non-jettisonable aerial cassette, equipped with concrete piercing SG357 bomblets and HB876 anti-transport mines has begun to enter line units in the British Air Force. The concrete-piercing bombs are intended to be used to crater VPP [runways] and taxiways of enemy airfields, and the mining accomplished at the same time, British military specialists believe, will cause it to take at least twice as long to repair the destruction.*

The HB876 mine (weight approximately 4 kg, casing diameter 100 mm, height 140 mm), which has a directional charge with a hollow-charge semi-spherical facing, is capable of destroying armored and heavy unarmored transport and engineer equipment. The foreign press indicates that tests demonstrated the rather high effectiveness of the mine, which has been chosen as the component for several other cassette bombs, besides the JPT233, in particular the British BL.755 and the American SUU-65/B and -54/B.

The jettisonable BL.755 750 pound cassette, after modernization and arming with 49 HB876 mines will be named HADES (Hunter Area Denial System). It is produced by the British firm Hunting Engineering. It will contain a device which fires mines radially, which will aid their better distribution in the established obstacle. It is planned to arm the SUU-65/B 1,000 pound cassette with 24 NB876 antitransport mines and 8 American BLU-106/B (BKEP) concrete-piercing bombs. As a unit they will form the DAACM (Direct Airfield Attack Combined Munition) aviation weapon, which is intended to strike enemy airfields. The SUU-54/B 2,000 pound cassette will contain 75 HB876 mines and 15 BLU-106 bombs. As a variant it may have a navigation system and solid fuel engine, which will enable it to be jettisoned a substantial distance from the targets, without the carrier aircraft entering the air defense zone.

---

*For more detail on the cassette see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1985, No 3, pp 50-52.

According to foreign press reports, all the above-described means of delivery of British HB876 anti-transport mines are in the design stage, and completion of their development is expected by the end of the 1980s.

9069
CSO: 1801/4

CHANGES IN PLANS FOR PURCHASE OF TORPEDOS FOR THE U. S. NAVY

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) p 77

[Article by Capt 1st Rank Yu. Zhukov: "Changes in Plans for Purchase of Torpedos for the U. S. Navy"]

[Text] During the unceasing arms race, the military and political leaders of the United States are intensively building up naval fire power, and in so doing are paying great attention to developing effective means of combating modern submarines. American specialists especially include torpedos among these weapons.

Since the tactical and technical characteristics of submarines, which influence their effective combat employment, have been changing very rapidly of late, in the opinion of U. S. Navy experts it is necessary, in order to combat them, to develop new torpedos with improved characteristics in a timely manner, as well as to modernize models previously placed in inventory, in order to lengthen their term of service until the new products enter the inventory in sufficient numbers.

This happened to the Mk48 torpedo, placed in inventory in 1972. Since then, new modifications appeared as a result of several modernizations. The latest was the Mk48 Mod 4 torpedo.

At present a contract has been concluded with the Hughes aircraft firm to start deliveries of the new modernized Mk48 Mod 5 torpedo (ADCAP -- Advanced Capability). It has a speed of 55 knots, a maximum depth of 914 meters and, in the opinion of the U. S. Navy command, will be effective in battle against the most modern nuclear submarines. Concluding this contract reflects a decision by the U. S. Navy leadership to cease purchases of the Mk48 Mod 4 torpedo. Initially it was planned to acquire 144 such torpedos during each of the fiscal years 1984-1986, and beginning in fiscal year 1987 begin purchase of Mk48 Mod 5 products. After the conclusion of scientific research and development work the plan was reexamined. According to the new schedule purchases of the Mk48 Mod 4 torpedos were reduced to 108 in fiscal year 1985, and beginning in 1986 their acquisition was halted altogether. Purchase of Mk48 Mod 5 torpedos began in 1985 (30 units costing $107 million). In Fiscal

Year 1986 it is planned to acquire 123 such torpedos (at a cost of $17 million), and in 1987 purchase of 280 is planned ($623 million).

According to foreign press reports, small-caliber antisubmarine torpedos have also been widely employed in the U. S. Navy. The most widespread models of this class are believed to be the Mk44 and Mk46 of various modifications, which refer to first and second generations respectively. Since the mid-1970s the U. S. has been developing the new Mk50 small-caliber antisubmarine torpedo (ALWT -- Advanced Lightweight Torpedo), a third generation weapon. In the 1990s it is to become the main model of weapons of this class. Instead of planned purchases of 1,521 Mk46 Mod 5 torpedos in Fiscal Year 1986, the U. S. Navy leadership requested funds for the acquisition of only 500 such torpedos. In fiscal years 1987 and 1988 their purchases will be at the same levels. Simultaneously, financing of efforts to modernize earlier models of the Mk46 will be carried out to improve its characteristics to the level of the Mk46 Mod 5. It is intended to lengthen the term of service of older models through these measures.

9069
CSO: 1801/4

NEW SYSTEM FOR UNDERWAY TRANSFER OF GOODS AT SEA

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 7, Jul 86 (signed to press 9 Jul 86) p 78

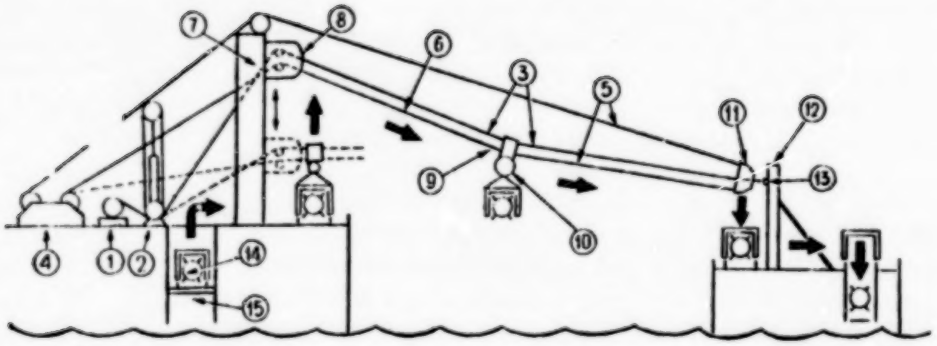
[Article by Capt 2d Rank (Res) V. Mosalev: "New System for Underway Transfer of Goods at Sea"]

[Text] U. S. Navy supply ships which are equipped with the fast automatic shuttle system for rapid transfer of goods (Fast Automatic Shuttle Transfer), designed to transfer missiles and other goods to ships underway at sea, are being refitted with the new Stream standard system (Standard Tensioned Replenishment Alongside Method). Thirty-nine ships, having 372 goods transfer posts with 1,100 winches, were equipped with the Fast System.

The Stream System makes it possible to transfer missiles rapidly by tie-beam, from the supply ship to a ship traveling at a speed of 12 knots, a distance of 46 meters apart, under sea conditions of up to wind force 5. It moves goods at a speed of 74 meters per minute with a tractive force of 48,849 kg. Goods are transferred by carrier cable, with the use of two winches, which maintain a constant level of tension to compensate for possible yawing. The winches have electronic controls and a hydraulic drive, contained in a housing that has a special fluid which isolates it from the corrosive effects of salt air.

The Stream System on a supply ship includes (see drawing): a winch(1) and a tension mechanism(2) of the carrier cable(3); two winches(4) of the upper(5) and lower(6) pulling cables; a fixed vertical cargo boom(7) with a transfer head which travels along the boom in the vertical plane(8); a cargo traveller(9) with a roller mechanism for lowering the cargo(10) and a pulley assembly head(11).

There is a special eye bolt(13) on the post where goods are received on the superstructure of the combatant vessel, to which the pulley assembly head(11) of the supply ship is fastened when goods are transferred. The eye bolt may be fixed or it may slide along a special cargo boom, which is fastened vertically to the superstructure. In the latter case, the roller mechanism for lowering goods on the cargo traveller is not used. When the cargo transfer system is in operation a traveller container with a missile(14) is lifted by an elevator(15) from the ship's missile storage to the upper deck, where it is fastened to the cargo traveller, which is lowered on the transfer



"Stream" system for underway transfer of cargo at sea

head along the boom. Then the head is moved up along the cargo boom and the traveller container moves at a speed of 74 meters per minute along the cargo carrier cable and the lower tension cable to the ship. After reaching the pulley assembly head it is lowered to the deck by means of the roller mechanism for lowering cargo or the eye bolt sliding along the beam. Once the traveller container is unfastened from the cargo traveller the former is sent to the missile magazine elevator and the missile is lowered into it.

Sacramento type fast all-purpose supply ships (4 units), Suribachi (5 units) and Kilauea (8 units) type special weapons and ammunition transports; Wichita type refueling tankers (7 units) and Mars type all-purpose supply transports (7 units) are equipped with the Stream system.

9069
CSO: 1801/4

-END-

END OF FICHE DATE FILMED

2 January 1987